



**GREEN  
CLIMATE  
FUND**

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28 – 31 March 2022  
Songdo, Incheon, Republic of Korea  
Provisional agenda item 13

**GCF/B.31/02/Add.01**

11 March 2022

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# Consideration of funding proposals - Addendum I

## Funding proposal package for FP182

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### **Summary**

This addendum contains the following seven parts:

- a) A funding proposal titled "Climate-smart initiatives for climate change adaptation and sustainability in prioritized agricultural production systems in Colombia (CSICAP)";
- b) No-objection letter issued by the national designated authority(ies) or focal point(s);
- c) Environmental and social report(s) disclosure;
- d) Secretariat's assessment;
- e) Independent Technical Advisory Panel's assessment;
- f) Response from the accredited entity to the independent Technical Advisory Panel's assessment; and
- g) Gender documentation.

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# Funding Proposal

Project/Programme title:	Climate-smart initiatives for climate change adaptation and sustainability in prioritized agricultural production systems in Colombia (CSICAP)
Country(ies):	Colombia
Accredited Entity:	Corporación Andina de Fomento (CAF)
Date of first submission:	<u>2021/03/29</u>
Date of current submission	<u>14/01/2022</u>
Version number	<u>V.012</u>



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### ***Note to Accredited Entities on the use of the funding proposal template***

- Accredited Entities should provide summary information in the proposal with cross-reference to annexes such as feasibility studies, gender action plan, term sheet, etc.
- Accredited Entities should ensure that annexes provided are consistent with the details provided in the funding proposal. Updates to the funding proposal and/or annexes must be reflected in all relevant documents.
- The total number of pages for the funding proposal (excluding annexes) **should not exceed 60**. Proposals exceeding the prescribed length will not be assessed within the usual service standard time.
- The recommended font is Arial, size 11.
- Under the [GCF Information Disclosure Policy](#), project and programme funding proposals will be disclosed on the GCF website, simultaneous with the submission to the Board, subject to the redaction of any information that may not be disclosed pursuant to the IDP. Accredited Entities are asked to fill out information on disclosure in section G.4.

**Please submit the completed proposal to:**

[fundingproposal@gcfund.org](mailto:fundingproposal@gcfund.org)

**Please use the following name convention for the file name:**

“FP-[Accredited Entity Short Name]-[Country/Region]-[YYYY/MM/DD]”

A. PROJECT/PROGRAMME SUMMARY			
<b>A.1. Project or programme</b>	Project	<b>A.2. Public or private sector</b>	Public
<b>A.3. Request for Proposals (RFP)</b>	<p>If the funding proposal is being submitted in response to a specific GCF <a href="#">Request for Proposals</a>, indicate which RFP it is targeted for. Please note that there is a separate template for the Simplified Approval Process and REDD+.</p> <p>Not applicable</p>		
<b>A.4. Result area(s)</b>	<p>Check the applicable <a href="#">GCF result area(s)</a> that the <u>overall</u> proposed project/programme targets. For each checked result area(s), indicate the estimated percentage of <u>GCF budget</u> devoted to it. The total of the percentages when summed should be 100%.</p>		
	<p><b>Mitigation:</b> Reduced emissions from:</p> <p><input type="checkbox"/> Energy access and power generation:</p> <p><input type="checkbox"/> Low-emission transport:</p> <p><input type="checkbox"/> Buildings, cities, industries and appliances:</p> <p><input checked="" type="checkbox"/> Forestry and land use:</p> <p><b>Adaptation:</b> Increased resilience of:</p> <p><input checked="" type="checkbox"/> Most vulnerable people, communities and regions:</p> <p><input checked="" type="checkbox"/> Health and well-being, and food and water security:</p> <p><input type="checkbox"/> Infrastructure and built environment:</p> <p><input type="checkbox"/> Ecosystem and ecosystem services:</p>	<p><b>GCF contribution:</b></p> <p><u>Enter number</u>%</p> <p><u>Enter number</u>%</p> <p><u>Enter number</u>%</p> <p>13%</p> <p>44%</p> <p>43%</p> <p><u>Enter number</u>%</p> <p><u>Enter number</u>%</p>	
<b>A.5. Expected mitigation impact</b>	9,152,034 tCO <sub>2</sub> eq over lifespan	<b>A.6. Expected adaptation impact</b>	<p>619,691 direct beneficiaries</p> <p>347,996 indirect beneficiaries.</p> <p>The direct beneficiaries are equivalent to 1.21% of total population (7.2% of total agricultural producers in Colombia).</p> <p>The indirect beneficiaries represent 0.68% of total population (4.1% of total agricultural producers).</p>
<b>A.7. Total financing (GCF + co-finance)</b>	<u>99,910,201</u> USD	<b>A.9. Project size</b>	Medium (Upto USD 250 million)
<b>A.8. Total GCF funding requested</b>	<u>73,283,080</u> USD <i>For multi-country proposals, please fill out annex 17.</i>		
<b>A.10. Financial instrument(s) requested for the GCF funding</b>	<p>Mark all that apply and provide total amounts. The sum of all total amounts should be consistent with A.8.</p> <p><input checked="" type="checkbox"/> Grant      <u>48,283,080</u>      <input type="checkbox"/> Equity      <u>Enter number</u></p> <p><input checked="" type="checkbox"/> Loan      <u>25,000,000</u>      <input type="checkbox"/> Results-based payment      <u>Enter number</u></p> <p><input type="checkbox"/> Guarantee      <u>Enter number</u></p>		
<b>A.11. Implementation period</b>	5 years	<b>A.12. Total lifespan</b>	25 years

<p><b>A.13. Expected date of AE internal approval</b></p>	<p><i>This is the date that the Accredited Entity obtained/will obtain its own approval to implement the project/ programme, if available.</i> 7/31/2021</p>	<p><b>A.14. ESS category</b></p>	<p><i>Refer to the AE's safeguard policy and <a href="#">GCF ESS Standards</a> to assess your FP category.</i> B</p>
<p><b>A.15. Has this FP been submitted as a CN before?</b></p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p><b>A.16. Has Readiness or PPF support been used to prepare this FP?</b></p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p><b>A.17. Is this FP included in the entity work programme?</b></p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p><b>A.18. Is this FP included in the country programme?</b></p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
<p><b>A.19. Complementarity and coherence</b></p>	<p><i>Does the project/programme complement other climate finance funding (e.g. GEF, AF, CIF, etc.)? If yes, please elaborate in section B.1.</i> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>		
<p><b>A.20. Executing Entity information</b></p>	<p>The Government of Colombia through the Ministry of Finance and Public Credit (MHCP) will be the entity responsible for the project loan resources from the Green Climate Fund (GCF) as well as the loan resources from CAF. For its part, the Ministry of Agriculture and Rural Development (MADR) will be responsible for executing the resources and technical implementation of the project through its Directorate of Innovation, Technological Development and Sanitary Protection. The CSICAP Project is presented as a national initiative under the leadership of the MADR, as executing entity (EE). MADR will be responsible for providing technical guidance for project implementation and supervising the International Center for Tropical Agriculture (CIAT), as Procured Party, to ensure that all activities are executed on time and with the required quality to ensure the achievement of project results. The MADR will receive technical support from the Alliance between Bioversity International and CIAT (part of the CGIAR, an accredited agency to the GCF), Agrosavia (the agricultural research institution in Colombia), CIMMYT, CIPAV, and producer associations (<i>gremios</i>)<sup>1</sup> (ASBAMA and AUGURA-Cenibanano (banana), ASOHOFRUCOL (plantain), ASOCAÑA-CENICAÑA (sugar cane), FEDEPANELA (panela cane), FEDECAFE - CENICAFE (coffee), FEDEPAPA (potato), FEDEARROZ (rice), FENALCE (corn) and FEDEGAN (livestock)), following the regulations and schemes defined and allowed under Colombian legislation.</p>		
<p><b>A.21. Executive summary (max. 750 words, approximately 1.5 pages)</b></p>			
<p>1. <b>The climate problem.</b> Colombia is projected to be negatively impacted by climate change, with temperature rises, changes in rainfall regimes, and greater frequency and intensity of weather and climate extremes (Fowler et al., 2021; <a href="#">Kharin et al., 2018</a>; <a href="#">Ramirez-Villegas et al., 2012</a>). Temperatures increased by 0.13 °C per decade in Colombia during the period 1971-2000, reaching 3 to 5 °C by mid-XXI century (<a href="#">Arnell et al., 2004</a>; IPCC, 2007; <a href="#">IDEAM, PNUD, MADS, DNP, CANCELLETERÍA, 2017</a>). Climatic variations relevant to agriculture occur at a range of timescales (from days to multiple decades), and it is virtually certain that anthropogenically-driven climate change will alter climatic patterns at all those timescales (<a href="#">Bindoff et al., 2013</a>; <a href="#">Donat et al., 2013</a>; <a href="#">Seneviratne et al., 2018</a>; <a href="#">IPCC, 2021</a>). More specifically, an amplification of ENSO-rainfall variability is projected by the new CMIP6 model ensemble (<a href="#">Yun et al., 2021</a>; <a href="#">IPCC, 2021</a>). Likewise, the frequency of extreme El Niño events is expected to increase with warming (<a href="#">Cai et al., 2018</a>; <a href="#">Wang et al., 2017</a>). Ultimately, while robust projection of ENSO is not feasible with the current generation of climate models, it is clear that ENSO-related climate variations will continue to challenge agricultural production in all regions of Colombia. Strong ENSO events can severely impair agricultural productivity in Colombia (<a href="#">Barrios-Perez et al., 2021</a>).</p> <p>2. According to the Third National Communication of Colombia, climate change is expected to have a major impact on the Colombian agricultural sector (<a href="#">IDEAM, PNUD, MADS, DNP, CANCELLETERÍA, 2017</a>), due to both the long-term trends in climate with progressive increase in temperature and large anomalies in the timing of periods of excessive rain and drought, as well as greatly increased variation in weather patterns with more frequent and anomalous extreme weather events. The Sixth Assessment Report (AR6) of the IPCC (<a href="#">IPCC, 2021</a>) Colombia is likely to be most challenged by extreme heat (especially in the lowland northern regions) and heavy precipitation events and flooding (across the Pacific and the inter-Andean Valleys). Unprecedented flooding events have been</p>			

<sup>1</sup> Gremio (plural gremios) refers to crop-specific private sector organizations that gathers small, medium and large-scale farmers, which aim to support farmers to improve competitiveness and income profitability. These organizations are nation-wide and have branches in all relevant areas for each specific agricultural system. Usually, the gremios provide a variety of services including, but not limited to, research and innovation, technical and commercial assistance, input provider, among others. Most of these gremios were established decades ago, they represent farmers before governmental institutions so that their needs are addressed. Some of those organizations have separate research and innovation entities to support farmers.

reported in recent decades in the lower reaches of the Atrato, Cauca, and Magdalena rivers (IPCC, 2021 – Chapter 12; [Avila et al., 2019](#)). Extreme precipitation can also drive landslides, with Colombia being considered one of the countries in Latin America with high incidence of fatal landslides. Regarding drought, it is estimated that 62% of the existing streamflow timeseries across the country exhibit a significant decreasing trend ([Carmona and Poveda, 2014](#); IPCC, 2021). Of particular concern are the northern lowlands (Caribbean region, and lower Cauca), where hydrological and agricultural drought affect agricultural production and livelihoods substantially current climates (<https://interactive-atlas.ipcc.ch>; [Perez et al., 2020](#); [Contreras, 2019](#); [Castro, 2019](#)). As a result of climate change, the supply of food and basic products, which is regularly affected by weather-related events, not only may be affected by reductions in crop and livestock productivity, but also by interruptions or delays in the mobilization of goods and services due to infrastructure damage that generates price spikes for poor urban consumers.

3. Among the most relevant challenges in the agricultural sector generated by climate change in Colombia are: i) losses in the livestock sector both in number of animals and productivity; ii) crop yields reductions; iii) reduced resilience of crops to extreme shocks associated with changes in climatic variables; iv) increased variation in both water excess and deficit affecting irrigation water availability; v) increased soil erosion; vi) more frequent deficits in surface soil moisture; vii) increased incidence of pests and diseases; viii) increased occurrence of unexpected fires; ix) reduction of the number of growing cycles; x) increase in greenhouse gas emissions arising from livestock production and deforestation, and; xi) increased variation in crop yields leading to decreased food and nutritional security. At the same time, it should be noted that increased CO<sub>2</sub> in the atmosphere will bring opportunities to increase water use efficiency in most crops and to higher potential yields per unit land area of the C3 crops.
4. Because climatic variations occur at a range of timescales and these variations are all affected by long-term climate change, adaptation needs to be framed accordingly. Adaptation strategies can be incremental, systemic, or transformational. Incremental adaptation helps respond to seasonal and interannual variations; systemic adaptation helps prepare for changes in the coming decades; and transformational change involves planning agricultural transitions when systems are no longer viable ([Ramirez-Villegas and Khoury, 2013](#); [Rippke et al., 2016](#)). Farmers have limited access to practices and technologies suitable for adapting to climate change and climate variability, and can therefore experience large economic losses. Most technological packages currently recommended to farmers are adapted to average weather conditions or climate: they are not tailored to the weather conditions which any individual farmer actually faces. As extreme climatic events have become more intense and frequent, with the consequent incidence of floods and droughts, added to rising temperature, producers have not had the tools to anticipate climate impacts and cope with physical and monetary losses. Furthermore, as international markets and global commitments respond to these sustainability and climate challenges through demands and technical requirements, countries will have to adapt their food systems to these challenges to maintain their competitiveness and food security. Colombia needs to accelerate programs that provide the technical and scientific required to provide concrete advances to resolve the problems producers face in meeting the challenge of climate change and to strengthen the institutional capacity to share knowledge of these advances both with and between the rural producers. Colombia is committed to reducing GHG but currently has limited information on how this can be achieved in the agricultural sector. Information is required to implement programs that minimize the GHG emissions in agriculture.
5. **Proposed interventions.** The Climate-smart initiatives for climate change adaptation and sustainability in prioritized agricultural production systems (rice, corn, banana, sugar cane, potato and cattle) in Colombia (CSICAP) has been formulated under the leadership of the MADR, with technical support from the alliance between Bioversity International and CIAT, in coordination with producer associations, AGROSAVIA and the Development Bank of Latin America (CAF), as accredited agency before the Green Climate Fund (GCF) for a total amount of USD 99.58 million. The implementation period will be five years with a scope / impact of 25 years. MADR will be the executing entity (EE) with the International Center for Tropical Agriculture (CIAT), as the main procured party. CIMMYT, Agrosavia, CIPAV and the gremios will act both as co-financiers and procured parties.
6. The **general objective** of the project is to reduce the vulnerability of agricultural production to climatic threats to minimize their impacts on the competitiveness of the agricultural sector and to have an adequate and stable availability of quality food by strengthening climate risk management, while reducing greenhouse gas emissions from agricultural production. The project seeks to change the current paradigm of agricultural production of intensive use of inputs, little adaptation of technologies to reduce the vulnerability of crops to droughts, floods and other climatic stressors. For this paradigm shift, the Project establishes three (3) purposes: (i) implement digital agriculture systems and climate services to modernize agricultural extension services and provide adaptation and mitigation recommendations that support the reduction of agro-climatic risks and the loss of crops, while promoting a low-carbon pathway; (ii) develop, validate and scale-up technologies (genetic improvement, crop management and other technologies) to increase resilience and low-carbon agricultural development and; (iii) strengthen the capacities of producers, technicians, and institutions for the adoption and implementation of technologies and propose new business models based on the massive adoption of technologies under environmental, social, and gender considerations.
7. The Project will have national scope on livestock and agricultural systems (rice, corn, potatoes, sugar cane, panela cane, livestock, coffee, bananas and plantains). The project will have the participation of agricultural producer

associations such as: ASBAMA and AUGURA-Cenibanano (banana), ASOHOFRUCOL (banana), ASOCAÑA-CENICAÑA (sugar cane), FEDEPANELA (sugar cane), FEDECAFE - CENICAFE (coffee), FEDEPAPA (potato), FEDEARROZ (rice), FENALCE and CIMMYT (corn) and FEDEGAN and CIPAV (livestock) and, AGROSAVIA (for all crops).<sup>2</sup>

8. **Climate impacts and benefits.** It is estimated that the Project will benefit directly more than 619,691 people, 194,871 rural producers and their families directly and 347,996 producers indirectly, and it is expected to increase the climate resilience of the agricultural system in a total of 967,997 hectares, distributed in 22 departments (69% of the country's departments) and 219 municipalities (20% of all municipalities). The total emissions that the project expects to reduce throughout its life is 9,152,034 tCO<sub>2e</sub>.

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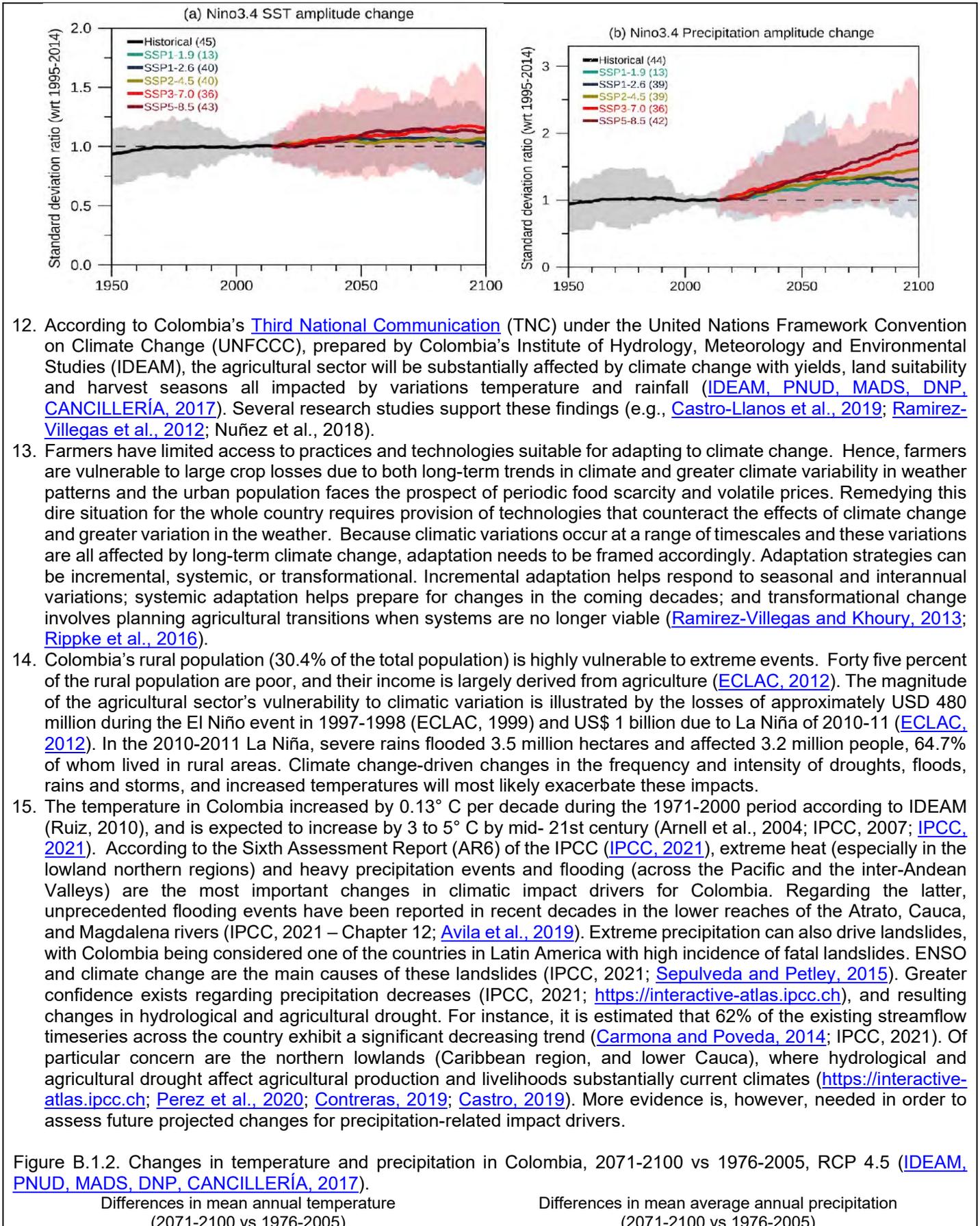
<sup>2</sup> The beneficiary producers do not need to be part of one of the gremios to participate in the project. By law, gremios support their members, but also other producers, because the gremios receive public funding to do that.

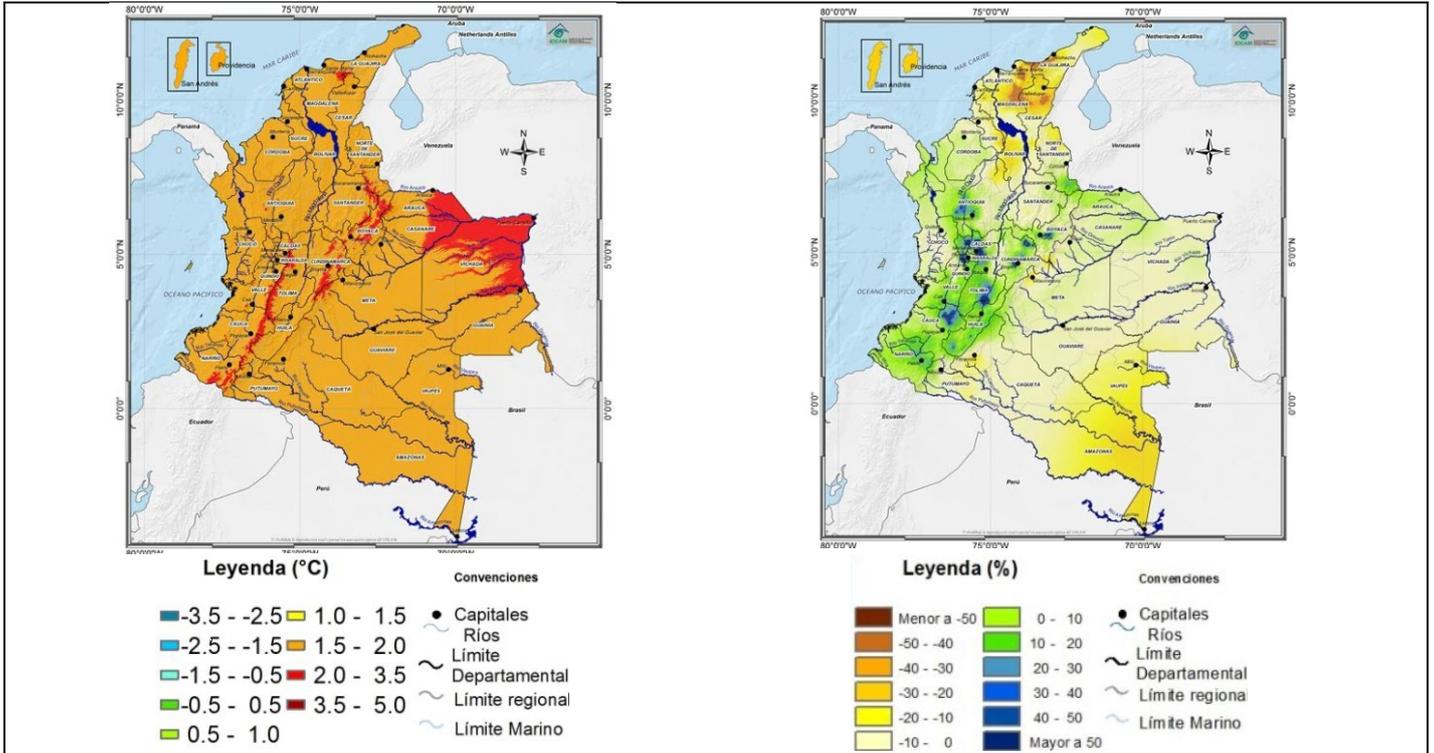
## B. PROJECT/PROGRAMME INFORMATION

### B.1. Climate context (max. 1000 words, approximately 2 pages)

9. **The climate problem.** The agricultural sector contributed 6.2% of Colombia's total GDP (DANE, 2020); the largest contribution within this agricultural GDP came from temporary and permanent crops (57%), coffee (11%), livestock (25%), forestry and wood extraction (3.5%) and fishing and aquaculture (2.8%). Approximately 43 million hectares are used in agriculture, of which 80% correspond to pastures and uncropped or fallow land and 20% to agricultural use (DANE, 2016). There are 2.4 million agricultural production units (UPA), most of which (44%) are located in the departments of Boyacá, Cundinamarca, Antioquia and Nariño. Land distribution is highly skewed with 70% of the UPA less than five hectares. The 0.2% of the UPA that are greater than one thousand hectares represent 74% of the dispersed rural area (dispersed rural area includes both residential and farmed land outside municipal limits (DANE, 2016). Colombia has a diverse range of climatic conditions ranging from paramos in the highlands, through cloud forest and inter-Andean valleys to coastal deserts and tropical rainforest. Each of these distinct climates shows distinct characteristics in terms of both climate variability and long-term climate change trends: there is no single description of how climate change will influence weather patterns in the country, as these patterns depend of the locality. Agricultural production is distributed both in lowlands and mountainous regions where most of the rural population lives (DANE, 2016). Farmers, depending on their location, face a series of climate/weather related threats including flooding, erosion, landslides, drought, waterlogging, above-average temperatures and extreme events including frosts, high winds, hailstorms and in the North the tail ends of hurricanes (Feola et al., 2015; [Barrios-Perez et al., 2021](#); Perez et al., 2020). These adversities are likely to increase with climate change ([IDEAM, PNUD, MADS, DNP, CANCELLERIA, 2017](#); [Ramirez-Villegas et al., 2012](#)). The supply of food and basic products is regularly affected by weather-related events, which not only directly reduce production in the field but also damage rural infrastructure and interrupt the supply chains, often leaving farmers with produce they cannot sell whilst leading to scarcity and price increases which hurt the urban poor.
10. Colombia has and will continue to be affected by the negative impact of climate change, including higher temperatures, periods of intense rain and drought, and a higher frequency of ever more extreme events. The IPCC's Sixth Assessment Report (AR6) ([IPCC, 2021](#)) continues to affirm the high sensitivity that exists in water resources, agriculture and livestock against of climate change scenarios for Colombia. AR6 shows more marked warming and observed increases in heat extremes and a positive trend for an increase in the frequency and length of droughts and a decrease in the index related to cold days. This has important implications for agriculture in Colombia, especially for threats and risks identified in Table B.1.1.
11. Climatic variations relevant to agriculture occur at a range of timescales (from days to multiple decades), and it is virtually certain that anthropogenically-driven climate change will alter climatic patterns at all those timescales ([Bindoff et al., 2013](#); [Donat et al., 2013](#); [Seneviratne et al., 2018](#)). A clear example of altered climate variability resulting from climate change relates to the El Niño Southern Oscillation (ENSO). ENSO is the most important mode of variability on Earth ([Cai et al., 2018](#)), and while 21st century ENSO projections entail high uncertainty, recent research suggests that the frequency of strong ENSO events is likely to increase as a result of climate change ([Cai et al., 2018](#); [Wang et al., 2017](#); [Yun et al., 2021](#); IPCC, 2021). Relatively early research (i.e., pre-AR5, e.g., [Stevenson, 2012](#) and references therein) already indicated that climate model simulations suggest changes in the ocean-atmospheric dynamics related to ENSO and its impacts. More recent research (post AR5, feeding into AR6) have contributed substantially to advancing our understanding of ENSO under climate change. Notably, [Freund et al. \(2020\)](#) suggest that future changes to ENSO depend on both mean state changes and decadal-scale natural variability, whereas Yun et al. (2021) demonstrate an amplification of ENSO-rainfall variability using the CMIP6 ensemble, regardless of the lack of signal in the amplification of the Sea Surface Temperature (SST) anomalies (Figure B1.1.1, also see IPCC, 2021). Various other studies contribute evidence on how ENSO responds to global warming. For instance, Wang et al. (2017) demonstrate that the frequency of extreme El Niño events increases linearly with increased global mean temperature, doubling at 1.5°C warming. Likewise, Cai et al. (2018) find a likely increase in the number of 'strong' equatorial Pacific El Niño events and associated extreme weather events using CMIP5. Ultimately, while a robust projection of ENSO is not feasible with the current generation of climate models, it is clear that ENSO-related climate variations will continue to challenge agricultural production in all regions of Colombia. Strong ENSO events can severely impair agricultural productivity in Colombia ([Barrios-Perez et al., 2021](#)).

Figure B.1.1. Changes in amplitude of ENSO variability. Variability of (a) SST and (b) precipitation anomalies averaged over Niño3.4 region for 1950-2014 from CMIP6 historical simulations and for 2015-2100 from four SSPs. Each line shows the average of all climate models for the historical period or for the SSPs. Shading is the 5-95% range across CMIP6 models. Taken from IPCC (2021) (Fig. 4.10; Chapter 4, WGI).





16. IDEAM's climate projections suggest that 26 of the 32 Colombian departments are likely to see large yield losses on basic crops associated with food security, such as cassava, rice, plantain, sugarcane, potatoes, maize and beans due to these changes unless remedial action is taken. The current and projected effects of climate change on both agricultural and livestock systems are alarming. In livestock, the economic impact of climate change in Colombia shows that the departments that have experienced the greatest reductions in livestock production are Nariño (18.5% reduction in production vis-à-vis the 1970-2010 baseline scenario), Casanare (6,0%), Córdoba (5.4%), Caquetá (4.6%), Guaviare (3.6%) and Cundinamarca (3.5%) (DNP, 2014). In the case of maize (FAO-MADR, 2013), yield losses are projected in the main production regions vis-à-vis the baseline scenario: humid Caribbean (25%); Orinoquia (20%); Upper Cauca Basin (11%) and Upper Magdalena (62%). Likewise, yield losses of around 25% are expected in rice production in Orinoquia, potato yield losses of around 10% will likely be experienced in Cundinamarca-Boyacá and around 40% in Nariño. It is estimated that sugarcane production is highly vulnerable to changes of over 2°C in temperature and over 3% in precipitation (Lau et al, 2010). Not only will yield be affected, but the timing of agronomic events and crop quality could also change. For example, banana phenology, related to quality for the export market, is likely to change with a negative impact on desirable characteristics and sugar concentration is likely to be reduced as temperatures rise. Furthermore, flooding, waterlogging and increased pest and disease pressure are likely. See Table B.1.1 for a summary of the impacts for the value chains considered in the Project. It is noteworthy that the body of evidence related to climate change impacts on crop production in Colombia is not very substantial. However, it clearly suggests that, even in relatively stringent climate mitigation trajectories such as RCP2.6 and RCP4.5, without adaptation actions climate change will negatively affect all eight agricultural sub-sectors targeted by CSICAP (see e.g., Ramirez-Villegas et al., 2012; Castro-Llanos et al., 2019; Jägermeyr et al., 2021).

Table B.1.1. Climate change risks and impacts in the targeted agricultural sub-sectors, and adaptation and mitigation interventions and benefits. Information provided is for RCP4.5 unless otherwise specified.

Sector / value chain	Threat / Climate risk	Impacts of climate change	Adaptation interventions and benefits	Mitigation interventions and benefits
Rice	- Low radiation/ low yields; - High humidity/increased diseases - Dry periods/irrigation supply problems	For the dry Caribbean region, a 22% reduction in climatic suitability is estimated for 2050 at RCP 8.5 (Castro-Llanos et al., 2019). For the humid Caribbean region, changes in crop phenology are expected by 2050 for all RCPs (Ramirez-Villegas et al., 2012). In the central part of the country, an 80% reduction in climate suitability is expected by 2050 with RCP 8.5 (Castro-Llanos et al., 2019). Impacts are projected	<b>Interventions:</b> Big Data platforms using remote and non-remote sensors and agroclimatic information services improved (climate and crops predictions and pest and disease alert prediction models); New varieties tolerant or resistant to drought, water deficit, high temperatures and low radiation (develop, validation, massive multiplication and deliver of seed to farmers); Water resource planning at the basin level; Massive implementation of agronomic management technologies	<b>Interventions:</b> Massive implementation of agronomic management technologies and transformation processes that promote low-carbon development <b>Benefits:</b> Direct emissions reductions 41,016 tCO2e

	<p>- High temperatures/low yields</p> <p>See: Castro-Llanos et al. (2019), <a href="#">Ramirez-Villegas et al. (2012)</a>, FAO &amp; MADR (2013), <a href="#">Cortés &amp; Alarcón (2017)</a>, <a href="#">Jägermeyr et al. (2021)</a></p>	<p>to be generally less under more stringent mitigation scenarios such as RCP2.6 or RCP4.5, with less severe yield and/or suitability reductions (<a href="#">Jägermeyr et al., 2021</a>; <a href="#">Ramirez-Villegas et al., 2012</a>). For the eastern plains region, a 25% reduction in yield is estimated for 2030 under RCP 4.5 (FAO and MADR, 2013; <a href="#">Jägermeyr et al., 2021</a>). In some regions where it is possible to take advantage of better climatic conditions projected for the crop are the middle and upper parts of the Magdalena inter-Andean valley (<a href="#">Cortés &amp; Alarcón, 2017</a>, FAO and MADR, 2013) and the upper part of the Cauca inter-Andean valley (<a href="#">Castro-Llanos et al., 2019</a>).</p>	<p>and transformation processes that enable more efficient use of water</p> <p><b>Benefits:</b> Increase productivity (20%), loss reduction, lower costs (8-13%) and increased profitability resulting technologies for agroclimatic risk management and digital agriculture adoption, use of genetically improved climate resilient varieties and efficient water use practices.</p>	
Maize	<p>- Low radiation/ low yields</p> <p>- High humidity/ increased diseases</p> <p>- Dry periods/ irrigation supply problems</p> <p>- High temperatures/ low yields/increased pests</p> <p>See: <a href="#">FAO and MADR (2013)</a>, <a href="#">Goavaerts et al (2019)</a>, <a href="#">CIMMYT and CIAT (2019)</a>, <a href="#">DNP-BID (2014)</a>.</p>	<p>Yield reductions are predicted in the main production areas of Colombia. Estimated yield reductions to 2030 for the humid Caribbean fluctuate between 12 and 28% (<a href="#">FAO and MADR, 2013</a>, <a href="#">Goavaerts et al., 2019</a>, <a href="#">CIMMYT &amp; CIAT, 2019</a>; <a href="#">Jägermeyr et al., 2021</a>). In the inter-Andean valleys, the yield reduction to 2030 is estimated to be between 6 and 62% (<a href="#">Goavaerts et al., 2019</a>, <a href="#">CIMMYT &amp; CIAT, 2019</a>, <a href="#">FAO and MADR, 2013</a>). For the eastern plains region, yield reductions to 2030 are estimated to be between 1 and 20% (<a href="#">Goavaerts et al., 2019</a>, <a href="#">CIMMYT &amp; CIAT, 2019</a>, <a href="#">DNP-BID, 2014</a>). At the local level, in Cereté (Córdoba) a decrease in yield of between 13% to 28% is expected, in Espinal (Tolima) between 6% to 8%, and in Uribe (Meta) from 1% to 3%.</p>	<p><b>Interventions:</b> Big Data platforms using remote and non-remote sensors and agroclimatic information services improved (climate and crops predictions and pest and disease alert prediction models); New varieties tolerant or resistant to drought, water deficit, high temperatures and disease resistance (develop, validation, massive multiplication and deliver of seed to farmers); Massive implementation of agronomic management technologies and transformation processes that enable more efficient use of water and promote low-carbon development.</p> <p><b>Benefits:</b> Increase productivity (10-27%), loss reduction, and increased profitability resulting technologies for agroclimatic risk management and digital agriculture adoption, use of genetically improved maize varieties and efficient water use practices.</p>	<p><b>Interventions:</b> Massive implementation of agronomic management technologies and transformation processes that promote low-carbon development.</p> <p><b>Benefits:</b> Direct emissions reductions 15,965 tCO<sub>2e</sub>.</p>
Cattle	<p>- Waterlogging-rainy season/ Forage rot</p> <p>- Dry periods/ low forage production</p> <p>- High temperatures/ animal stress</p> <p>(<a href="#">DNP-IDB, 2014</a>; <a href="#">DNP-BID, 2015</a>), <a href="#">CIAT</a> and <a href="#">CORMACARENA (2018)</a></p>	<p>For cattle farming, the economic impacts of climate change in Colombia show that the departments experiencing the greatest reductions in cattle production are Nariño (18.5% reduction in production when compared to the 1970-2010 baseline scenario), Casanare (6.0%), Córdoba (5.4%), Caquetá (4.6%), Guaviare (3.6%) and Cundinamarca (3.5%) (<a href="#">DNP-IDB, 2014</a>, <a href="#">DNP-BID, 2015</a>).</p>	<p><b>Interventions:</b> Big Data platforms using remote and non-remote sensors and agroclimatic services (information and recommendations) for ranchers; New forages varieties tolerant or resistant to drought, water deficit and excess (develop, validation, massive multiplication and deliver of seed to farmers); Quantifying the water footprint; Evaluation of efficient water use practices; Massive implementation of agronomic management technologies and transformation processes that enable more efficient use of water.</p> <p><b>Benefits:</b> Increase in 12% in productivity for beef cattle and double the yields for dairy farming resulting increased profitability from adoption of technologies for agroclimatic risk management and digital agriculture adoption and efficient water use practices.</p>	<p><b>Interventions:</b> Landscape restoration and technology transfer and scaling (implementation of sustainable livestock models: silvo-pastoral systems, pasture rotation, pasture improvement, living fences); Massive implementation of agronomic management technologies and transformation processes that promote low-carbon development; Quantifying the carbon footprint.</p> <p><b>Benefits:</b> Direct emissions reductions 208,220 tCO<sub>2e</sub></p>
Panela sugarcane	<p>- High temperatures/ increased pest infestation</p> <p>- Excess of water/plant rot</p> <p>- Dry periods/low yields</p> <p>Since there are no specific studies on this crop, the risk comes from the expert's opinion from the gremio, Agrosavia, Cenicaña and CIAT.</p>	<p>This is a crop of great social importance in Colombia, as it is the basis for the livelihoods of some 160,000 families of smallholder farmers. However, little has been studied and there is practically no research related to climate. However, it is expected to have similar behavior as sugarcane, and may experience gradual loss of climate suitability and decrease in yields by 2050 (<a href="#">Ramirez-Villegas et al., 2012</a>).</p>	<p><b>Interventions:</b> Big Data platforms using remote and non-remote sensors and agroclimatic services (information and recommendations) for panela sugar cane producers. New varieties tolerant or resistant to drought, water deficit and high temperatures (develop, validation, massive multiplication and deliver of seed to farmers); Quantifying the water footprint, water resource planning at the basin level, evaluation of efficient water use practices; Massive implementation of agronomic management technologies and transformation processes that enable more efficient use of water.</p> <p><b>Benefits:</b> Increase productivity (65%), loss reduction, lower costs (30%) and increased profitability resulting technologies for agroclimatic risk management and digital agriculture adoption and efficient water use practices.</p>	<p><b>Interventions:</b> Massive implementation of agronomic management technologies and transformation processes that promote low-carbon development; Quantifying the carbon footprint.</p> <p><b>Benefits:</b> Direct emissions reductions 78,799 tCO<sub>2e</sub>.</p>
Potato	<p>Dry periods/low yields</p> <p>Excessive rainfall/increased diseases</p> <p>Frosts/crop loss</p>	<p>The areas for this crop are concentrated in the high zones of the mountains of the Andean region, and the estimated yield reduction to 2030 is estimated at between 10% and 40% (<a href="#">DNP-BID, 2014</a>, FAO and MADR, 2013). <a href="#">DNP-BID (2014)</a> estimates</p>	<p><b>Interventions:</b> Big Data platforms using remote and non-remote sensors and agroclimatic services (information and recommendations) for potato producers; New varieties tolerant or resistant to drought, water deficit and high temperatures (massive multiplication and deliver of seed to farmers); Massive implementation of agronomic</p>	<p><b>Interventions:</b> Massive implementation of agronomic management technologies and transformation processes that promote low-carbon</p>

	High temperatures/increased pests, displacement of production  <a href="#">DNP-BID (2014)</a> , <a href="#">FAO and MADR (2013)</a>	that Nariño and Cundinamarca will have the greatest reductions in yields. The drop in yields compared to those simulated in the baseline scenario are related to the higher expected occurrence of irregular precipitation periods (rainfall concentrated in short periods and long periods without rain) and increases in air temperature that affect various physiological processes of the crop. In Cundinamarca, a decrease in yields ranging from 5% to 35% when compared with those estimated for the 2000-2010 period is expected. In addition, in the case of Boyacá, there would be a downward trend ranging from 7% to 12% for yields between the period 2041 and 2070.	management technologies and transformation processes that enable more efficient use of water and promote low-carbon development (conservation tillage models)  <b>Benefits:</b> Increase productivity and loss reduction (16-20%), lower costs (10%) and increased profitability resulting technologies for agroclimatic risk management and digital agriculture adoption and efficient water use practices.	development (conservation tillage models).  <b>Benefits:</b> Direct emissions reductions 34,324 tCO <sub>2</sub> e
Coffee	Excessive rainfall/low yields High temperatures/berry borer infestation  <a href="#">Ramirez-Villegas et al. (2012)</a> , (CIAT-USAID-FNC, 2017).	Coffee is distributed in the mid-mountain zone across the entire mountain geography of the Andean region. Here, changes in the phenology of the crop are expected by 2050 (Ramirez-Villegas et al., 2012), a gradual loss of climatic suitability and decrease in yields by 2050, above 1500 masl (Ramirez-Villegas et al., 2012), and an intensification of problems related to pests and diseases (below 1500 masl) by 2050 ( <a href="#">Ramirez-Villegas et al., 2012</a> ). In a specific study in Colombia's 'coffee-growing region' as it is known, it was reported that by 2030, 22% of the current suitable coffee-producing area is expected to have been lost (CIAT-USAID-FNC, 2017).	<b>Interventions:</b> Big Data platforms using remote and non-remote sensors and agroclimatic information services improved (climate and crops predictions and pest and disease alert prediction models); New varieties tolerant or resistant to pest resistance (massive multiplication and deliver of seed to farmers); Water resource planning at the basin level; Evaluation of efficient water use practices.  <b>Benefits:</b> Increase productivity (10-15%), loss reduction, lower costs (3-7%) and increased profitability resulting technologies for agroclimatic risk management and digital agriculture adoption.	
Sugarcane	Waterlogging/crop loss Dry periods/irrigation supply problems  FAO and MADR (2013). <a href="#">Ramirez-Villegas et al., (2012)</a> .	Higher temperatures, higher dioxide concentration, and higher yields 12.5% (FAO and MADR, 2013). Gradual loss of climate suitability and decrease in yields by 2050 ( <a href="#">Ramirez-Villegas et al., 2012</a> ).	<b>Interventions:</b> Big Data platforms using remote and non-remote sensors and agroclimatic information services improved (climate and crops predictions and pest and disease alert prediction models); New sugarcane varieties tolerant or resistant to drought, water deficit and excess (develop, validation, massive multiplication and deliver of seed to farmers);  <b>Benefits:</b> Increase productivity by 20%, loss reduction, and increased profitability resulting technologies for agroclimatic risk management and digital agriculture adoption and use of genetically improved varieties.	
Musaceae	Dry periods/low yield High temperatures/low yields and increased pest infestation	Banana crop is concentrated in two regions of the country, one near the humid Caribbean zone and the other near the dry Caribbean. Changes in crop phenology are expected by 2050, changes in pest and disease incidence (below 500 masl) by 2050 and gradual loss of climatic suitability and decrease in yields by 2050, below 500 masl ( <a href="#">Ramirez-Villegas et al., 2012</a> ). Plantain crop is found throughout much of the national geography and in different thermal floors. By 2030, problems are expected with high temperatures and therefore loss of climatic suitability in the lower parts, especially in the dry humid Caribbean and the Orinoquia (CIAT, 2014).	<b>Interventions:</b> Big Data platforms using remote and non-remote sensors and agroclimatic services (information and recommendations) for banana and plantain producers; New varieties tolerant or resistant to drought, water deficit and high temperatures (validation, massive multiplication and deliver of seed to farmers); Quantifying the water footprint; Water resource planning at the basin level; Evaluation of efficient water use practices; Massive implementation of agronomic management technologies and transformation processes that enable more efficient use of water.  <b>Benefits:</b> Increase productivity (16-22%), loss reduction, lower costs (15%) and increased profitability resulting technologies for agroclimatic risk management and digital agriculture adoption, and efficient water use practices.	<b>Interventions:</b> Massive implementation of agroclimatic services of agronomic management technologies and transformation processes that promote low-carbon development.; Quantifying the carbon footprint.  <b>Benefits:</b> Direct emissions reductions 53,973 tCO <sub>2</sub> e.

Source: Own elaboration.<sup>1</sup> [IDEAM, 2015](#)

17. Given the extent and scope of climate change impacts, actions are needed that put climate-smart varieties, agricultural technologies, practices, and information services in the hands of farmers so that they are better prepared to respond to existing and new climate-related stresses. These technologies will help farmers cope with climatic variability and extremes (both which are projected to change under climate change, Fowler et al., 2021; Kharin et al., 2018), and continue with their agricultural activities in the shifted temperature and rainfall regimes expected in the coming decades. Likewise, greater knowledge production, management and exchange is needed to strengthen agricultural extension services, improve institutional capacities, and farmers' knowledge and ability to implement climate-smart technologies.

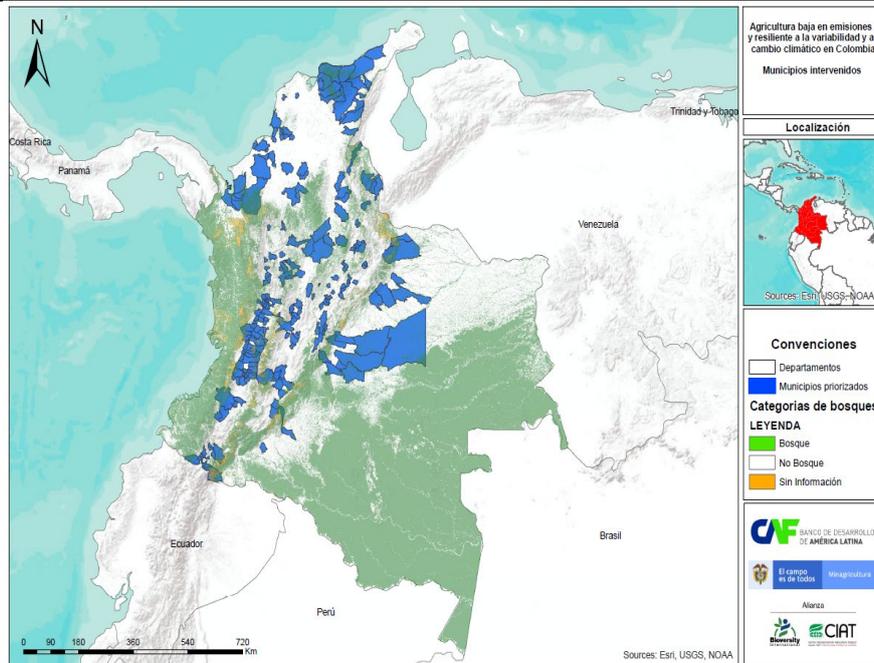
18. The country currently lacks appropriate agro-climatic advisory services, and an agricultural research and extension system that can provide producers with time and site-specific information on how to respond to climate variability and climate change. Furthermore, agricultural technology development in Colombia has been based on the top-down linear model largely directed to increasing yield under favorable weather conditions, whence producers have few technological options to meet the challenges of more variable and often adverse weather conditions. Furthermore, there is only limited institutional capacity to develop technology specifically designed for current and future adverse weather conditions, emphasizing the need to build institutional capacity to not only develop resilient agricultural technology but also to ensure that farmers have access to and confidence in novel, robust farming techniques. Within this context Colombia has not embraced the widely accepted move towards innovation systems and continuous to follow the outmoded pattern of research followed by validation and then extension.
19. **Context – Adaptation and mitigation needs**
20. **Adaptation needs.** The most relevant impacts of climate variability and change in the agricultural sector in Colombia include: i) losses in livestock, both in terms of the number of animals and productivity; ii) losses in crop yields; iii) reduced crop resilience to external shocks linked to changes in climatic variables; iv) reduced water availability; v) increased soil erosion; vi) reduced topsoil moisture; vii) increased incidence of pests and diseases; viii) increased occurrence of unexpected fires; ix) reduced number of growing cycles; x) decreased food and nutritional security.
21. Irrigation provides only 10% of the water requirement for permanent and transitory crops and the remaining 90% is provided by rainwater. This increases the vulnerability of the sector, considering the changes in precipitation regimes due to climate change (MADR-PIGCCS, 2020). The irrigation requirement is higher in sugarcane, palm and bananas, which represent 55% of irrigation water in agriculture. For its part, the irrigation requirement of temporary crops is concentrated in irrigated rice cultivation, which represents approximately 13% of irrigation water in agriculture.
22. **Mitigation needs.** According to the TCN, the agricultural sector is the second most important source of greenhouse gas (GHG) emissions in Colombia, contributing 30% of total emissions. Emission sources in the agricultural sector include enteric fermentation produced by livestock, manure handling, rice cultivation, prescribed burning in savannas, field burning of agricultural residue and agricultural soils as a source of nitrogen as part of various agricultural practices (applying synthetic fertilizers, adding manure and agricultural residues to the soil as fertilizers, nitrogen-fixing crops, and mineralization of soil organic nitrogen). In this sense, it is necessary to improve practices in both livestock and agricultural production to reduce GHG emissions. In the case of rice, there is no information on the emission levels associated with different crop technologies, and low carbon technologies have not been identified and quantified. There is no mitigation plan or strategy for this crop at the aggregate level, despite being one of the most emitting crops. For other crops, there is no certainty about low-carbon technologies that can be scaled-up to the region. In the case of livestock, a large area and numerous regions and livestock systems must be covered, which makes it challenging to scale-up this technological approach.
23. With technical support from MADS and DNP, MADR carried out a technical exercise to identify and prioritize mitigation measures for the agricultural, forestry and land-use change sectors, considering the following criteria: i) Expected increase or decrease of the area used in 2018 for agricultural production systems, *Colombia Siembra* program; ii) Representative nature of agricultural activities in the national territory (area); iii) Reference of NAMA structured documents; iv) Potential for reduction based on information (Uniandes 2015 sheets, MADR CIAT 2012-2015 agreements); v) Technical meetings to coordinate the AFOLU sector. The GHG emission reduction measures identified in 2017, as well as the cost of implementing these measures up to 2030, which amounts to USD 4,884.6 million. It is estimated that implementing these measures would reduce GHG emissions by 16,180 Gg CO<sub>2</sub>eq.
24. **Project definition and justification.** In order to respond to the negative impacts of climate variability and climate change in Colombia's agricultural sector and to contribute to the fulfillment of national goals and objectives in promoting low-emission and climate-resilient agricultural development, the MADR, with support from CAF, the Bioversity International and CIAT Alliance, AGROSAVIA, gremios working with livestock and rice, maize, potato, panela sugarcane, sugarcane, coffee, banana and plantain crops, prioritized the formulation of the CSICAP Project, which covers and adequately reflects the needs and requirements in terms of technology, knowledge and information for the crops prioritized in the Project's framework and scope.
25. In a scenario without the Project and the proposed interventions, the previously described problems affecting the agricultural sector would persist or further deteriorate. This would lead to limited investment in innovative proposals such as using digital media to disseminate climate information. Similarly, there would be limitations in investments to develop climate-resilient or low GHG emitting varieties, since there would be limited knowledge of the water footprint and water-efficient technologies, and on the carbon footprint of agricultural production chains.
26. The CSICAP Project is a national initiative aimed at developing, validate, replicate and scaling-up low carbon and climate resilient practices and lessons learned from the national government's efforts in the pilot project and other initiatives to mainstream Climate-Smart Agriculture and Livestock Farming as a transformational approach and promote actions that contribute to low-emission, resilient agriculture and livestock production. Additionally, the Project seeks to create institutional, technical and governance capacities that enable the effective adoption of low carbon and climate resilient practices and technologies which integrate climate information in decision-making

processes and innovate in more sustainable production models that are adapted to the country's different economic, social and environmental aspects. The CSICAP Project also seeks to address the different barriers that have prevented scaling-up resilient and low-emission activities in the agricultural sector, by implementing knowledge management strategies, different technology transfer approaches and producer association's extension services, thereby strengthening the enabling factors required for its implementation.

27. Finally, the CSICAP Project is aligned with nationally-set priorities to strengthen the role of the agricultural sector. It is also in line with GCF's investment criteria to generate transformational impacts in development models that contribute to a stronger adaptation capacity regarding current and future climate variability and climate change risks, while also contributing to a reduction in greenhouse gas emissions.
28. **Objective of the Project.** The overall objective of the project is to reduce the agricultural production's vulnerability to climate hazards to minimize their impacts on the sector's competitiveness and ensure sufficient and stable availability of quality food by strengthening climate risk management, while reducing greenhouse gas emissions. The following are the specific objectives of the CSICAP Project:
- Modernize the agricultural extension system to be climate responsive through the implementation and use of digital agriculture systems and climate services to provide recommendations on adaptation and mitigation measures. This will include providing direct technical support to approximately 123,389 producers and indirect support to 104,000 users, who will receive recommendations through the climatic services platforms and 15 Agroclimatic Technical Working Groups to reduce crop losses.
  - Develop, validate, and implement at least 30 new low-emission and resilient technologies and scale-up 70 existing technologies (genetic improvement, crop management techniques and other technological options)<sup>3</sup> in 131,710 hectares, to increase resilience and promote low-carbon agricultural development by reducing 432,297 tons of CO<sub>2</sub>e in 8,750 hectares.
  - Strengthen capacities and improved business models on climate resilience and low-carbon technologies in at least 60 entities of the agricultural sector (including Departmental and Municipal Agriculture Secretariats) covering 4,400 technicians and reinforce training among 54,000 agricultural producers for low-carbon and resilient agriculture considering environmental, social and gender aspects, to ensure adequate technological adoption.
29. **Scope.** The CSICAP Project is national in scope, and it considers livestock and eight crops: rice, maize, potato, sugarcane, panela sugarcane, coffee, and musaceae (banana and plantain). CSICAP will be implemented in 22 departments and 219 municipalities, directly benefiting 619,691 people, of which there are more than 194,871 producers from different livestock and producers' associations and their families (424,820 people) and reducing or avoiding emissions amounting to 9.15 million tCO<sub>2</sub>e during the project lifespan.

Figure B.1.2. Map of prioritized municipalities where direct actions will be carried out as part of the CSICAP Project

<sup>3</sup> In the case of rice and maize, the aim is to scale technologies that were previously evaluated in the pilot and were found to perform well. For example, the MIRI system for low water consumption in rice; Cenicaña developments in the efficient use of water, Augura development in bio-pesticides and efficient use of fertilizers; Fedepanela with more efficient burner systems and fertilizer use; Fedegan, CIPAV, Agrosavia and the CIAT- Bioversity Alliance with sustainable livestock systems model; Cenicafé with systems for the efficient use of fertilizers and harvesting, treatment and use of water in agroforestry models; in potatoes with minimum tillage and conservation agriculture developed by the CIAT Bioversity Alliance..



30. **Related interventions and shortcomings to be addressed.** MADR, Agrosavia, and the producer associations (to a greater or lesser extent, depending on each sector) are the main actors in the development and validation of agricultural technologies and practices. Colombia's MADR has focused its climate-smart agriculture (CSA) efforts on new agricultural technology developments, agro-climatic forecasting and related advisory services, site-specific or precision agriculture approaches, and low-carbon agricultural practices. These are aligned with sustainable intensification at the farm level and include efficient use of natural resources. Similarly, MADR considers low-emissions and climate resilient interventions at the landscape level (e.g., management of farm and forest boundaries), services (in particular information and finance services), institutions (particularly market governance, incentives for adoption) and food systems (especially consumption patterns and broader climate-informed safety nets). In this sense, **MADR developed a pilot experience** to work on alternatives to reduce crop losses due to climatic factors. MADR signed a Technical and Scientific Cooperation agreement with the International Center for Tropical Agriculture (CIAT) at the end of 2012, to improve the agricultural sector's competitiveness, by increasing investment in climate-related research, technological development and innovation. This scientific alliance made it possible to join efforts, resources and institutional capacities to strengthen the agricultural sector's capacity to adapt to climate variability and climate change and improve resource efficiency in some regions' productive systems. One of the main results of this agreement was the joint work carried out between the national government, academia, research centers, NGOs and producer associations in the productive chains.
31. The pilot project included four components: (a) agroclimatic risk management, (b) site-specific agriculture, (c) testing new technologies for adaptation, and (d) evaluating sustainable production systems. Fedearroz and Fenalce engaged in work involving three crops: rice, maize and bean. During the pilot phase, **progress was made in developing and validating climate forecast models for some of the prioritized areas**, and an initial analyses on Site-Specific Agriculture. Advanced waterlogging- and drought-tolerant lines were evaluated, and the water footprint was measured for different production systems, including rice. The producer associations (Fedearroz and Fenalce) consider that the information and tools created during two years' worth of work were valuable and hold great potential. Similarly, **a capacity-building process to benefit producer associations' technicians** was initiated, and information on certain specific issues was delivered directly to the producers. The pilot project also included other elements, such as **measuring the carbon footprint** in palm, Intensive Silvopastoral Systems and Fruit Trees; measurements were made to determine **soil loss and water footprint** in potatoes, and cassava materials were evaluated. Annex 23 provides a detailed analysis of the result of the pilot activities.
32. The results of the pilot evidenced a great potential, but also gaps, for adapting the agricultural sector to climate change. Some of those **gaps** for up-scaling and replication include knowledge and resources (human, technological, etc.) to develop the necessary tools and instruments to reach local producers with recommendations of climate resilient and low-carbon technologies. As later discussed in section B.3, there are still several gaps in data collection and digital tools, limited use of digital media to disseminate climate information coverage of climate services, limited capacity by the gremios to develop climate resilient genetic resources, and gaps in extension services. For example, most of the gremios are highly dependent on the technological developments that are carried out in research centers, and it is unlikely that the latter will generate the technology needed for all crops and

under different environmental conditions. In the best of cases, generic technologies are developed that are applicable in certain contexts. The **CSICAP project seeks to address those gaps, expand activities to other crops not included in the original pilot** (e.g. coffee, sugarcane, panela sugarcane, and musaceae) **and expand its geographic coverage to a greater number of municipalities and farmers** (Figure B.1.2). It is worth noting that most of the gremios work on the promotion of technologies and, depending on the gremio, they develop technologies related to various agronomic and product processing issues. As mentioned earlier, most of the gremios do not have the capacity to develop the tools and instruments that will be developed with the project, but have the capacity to implement them and to continue with the work after their development. In some cases, the gremios have the technical capacity to achieve some of the outputs, but not all, and the few that can do it, do not do it due to budget constraints. That is, what the project would achieve in 5 years for the strongest gremios (coffee, rice, bananas), it may take more than 20 years to achieve it by themselves. Once these tools are developed, and the gremios appropriate them, it is expected, as it occurred with the pilot, that it will have a positive impact on farmers, and that the gremios will continue and expand their operation and application.

33. **Progress and basic investment.** On the other hand, the CSICAP project complements several agricultural and climate-change interventions that have been developed in Colombia, besides the pilot mentioned above. These include:

- The [Sustainable Bovine Livestock NAMA](#) with the participation of the Colombian Livestock Federation (FEDEGAN), the Center for Research on Sustainable Agricultural Production Systems (CIPAV), CIAT (LivestockPlus), MADR and MADS. The total project amount is USD 8.2 million, of which USD 5.8 million is private investment, USD 1.6 million are national public resources and USD 0.8 million international funds.
- The GEF project for the initial implementation of the [NAMA for the Panela subsector](#) (USD 2 million), which includes the participation of Fedepanela, CAF, the Financing Fund for the Agricultural Sector (FINAGRO), MADR and MADS.
- The CGIAR Research Program on Climate Change, Agriculture and Food Security ([CCAFS](#)) and the International Center for Tropical Agriculture (CIAT) have worked on various initiatives regarding climate change and the [agricultural sector](#) in Colombia. CIAT-CCAFS led the creation of six Agroclimatic Technical Working Groups (MTA) and carried out critical scientific research that enabled widespread and sustained use of site-specific agroclimatic forecasts. Research results included agronomic practice manuals to support agronomic forecasts and training in the collection and use of site-specific data. Through the MTAs, local and national governments, producer associations such as the National Federation of Cereal, Legume and Soy Growers (Fenalce), the National Federation of Rice Growers (Fedearroz), the National Federation of Coffee Growers (FNC) and Cenicaña, and other participating institutions such as Agrosavia and universities, have institutionalized CIAT-CCAFS' climate information in their decision-making processes. CIAT-CCAFS' scientific work and capacity building in crop modeling and seasonal climate projections allowed national partners, particularly Fedearroz and Fenalce, to analyze local conditions and produce and disseminate seasonal agro-climatic forecasts in maize and rice-producing regions.<sup>4</sup> CIAT-CCAFS scientists assessed the information needs in Santander, Córdoba, Tolima, Valle del Cauca, and Meta, thereby enabling the provision of tailored services for users and identifying and inviting participants to MTAs. For example, joint work with Fedearroz has enabled determining [suitable areas for rice production under climate change](#) in the five rice-growing areas: Bajo Cauca, Centro, Llanos Orientales, Santanderes and Costa Norte. These studies determined that the geographic valleys of the Cauca and Patía rivers will be more suitable in the future than the Magdalena River valley (Huila and Tolima) is today, as its suitability will be slightly reduced. These analyzes have been used to determine climate-change adaptation strategies for rice crops.
- Other GCF projects may complement geographically the project activities, such as the Amazon Bioeconomy Fund ([FP173](#)) which focuses on coffee value chains in the Amazon basin, an area not covered by the proposed project. For the project on "Scaling up climate resilient water management practices for vulnerable communities in La Mojana" ([FP056](#)), both projects will be working in a common municipality (San Marcos, Sucre), where they will complement each other as the proposed project will work on mitigation (measurement of GHG in rice), while FP056 is working on adaptation. Although working in different regions, both projects work on agroclimatic information and can interact to share and strengthen knowledge between them.

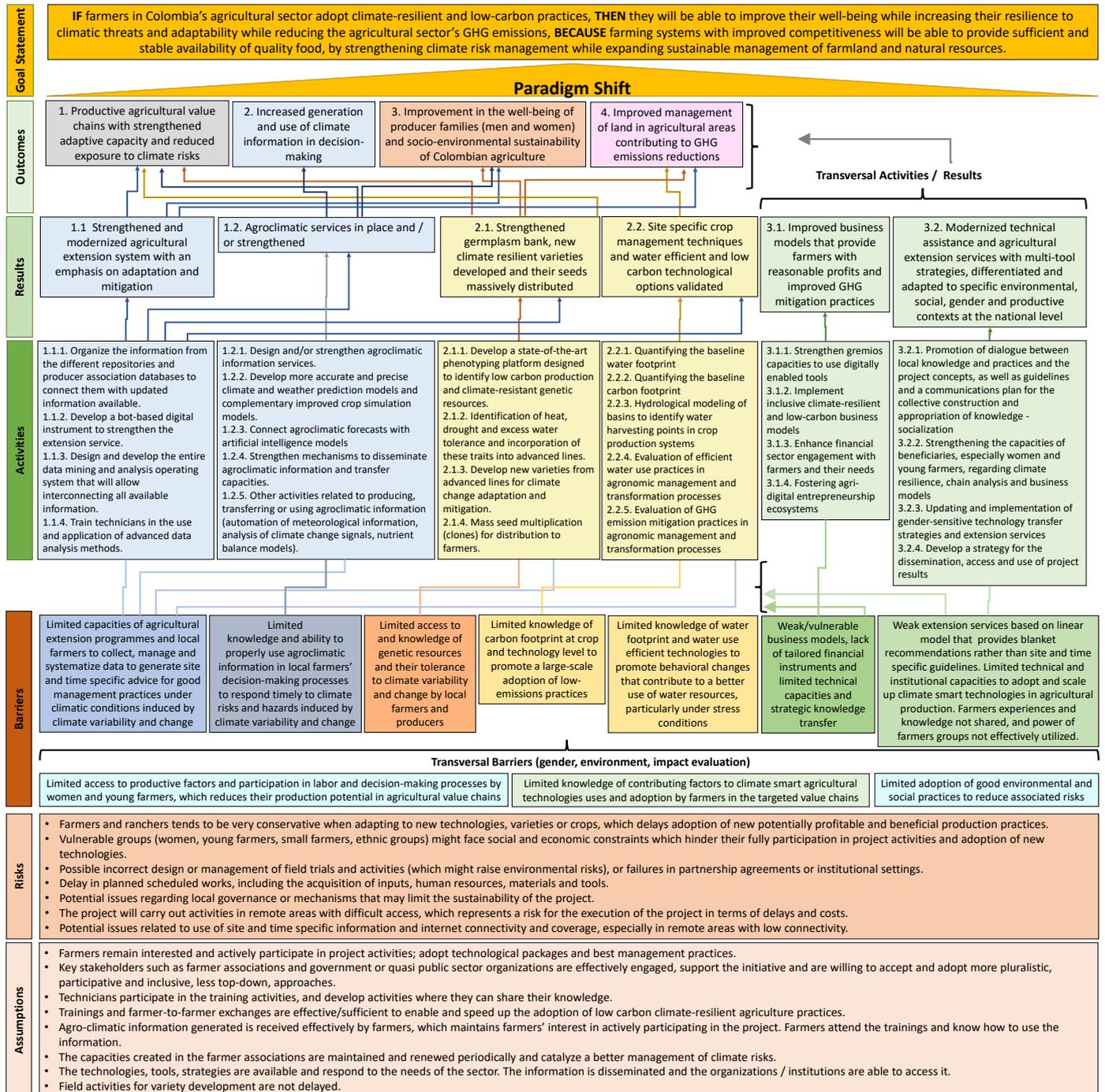
## B.2. Theory of change (max. 1000 words, approximately 2 pages plus diagram)

<sup>4</sup> From the experience with Fenalce and Fedearroz, the development, dissemination and use of site-specific climate information and data platforms has some constraints and challenges, including digitalization of existing data, organization of different databases and formats, and the collection of missing data (e.g. soils for Fenalce). For the use of data, training is required for technicians and farmers to understand the information provided by the tool, which requires time to achieve confidence especially for the gremios' technicians, since the farmers have a high degree of confidence on them. A limitation that remains is coverage, since each technician is able to visit and collect information from a limited number of farms (approx. 100), and the use of all remote and non-remote instrumentation would substantially expand the coverage.

34. Aware of the economic, social, and environmental challenges associated with the impacts of climate change in the Colombian agricultural sector, the Government of Colombia, producer associations and other key actors within the agricultural sector are increasingly looking for effective ways to promote a more sustainable, inclusive and resilient development pathway. Substantial efforts are needed to ensure systematic and structural change, and this transition faces barriers that are diverse and intertwined. While this approach may not respond to other financial and governance challenges that are also relevant to the sustainable and inclusive development of the agricultural sector, the theory of change proposes that Program activities will be sufficient to produce the expected results and impacts to achieve a paradigm shift towards a low-carbon, climate-resilient development trajectory. The Theory of Change is outline in Figure B.2.1 and described in detail in the following paragraphs.
35. **Project Goal.** The overall long-term goal of the CSICAP project is to reduce the vulnerability of agricultural production and the most vulnerable segments of the rural population, especially women, to the threats of variable weather and climate change. At the same time, a national goal is to reduce GHG emissions from agricultural activities. As part of that goal, the project seeks that farmers and those engaged in agriculture to have better information, site and time specific, on currently available technologies suitable for their particular climate needs. This would enable farmers to better manage their crops because they would be able to tailor their crop management to their particular farm conditions, including changes in climate variability and climate change. If novel technological solutions to combat climate variation and climate change were to be developed and then shown to be effective, then farmers would adopt these technological solutions and become less vulnerable, while using less resources. If growers and extension agents were able to access information and share experiences on how best to manage crops for specific sites in both space and time, then farmers would manage their crops better, leading to more stable production. If farmers were aware of the GHG emissions associated with distinct management of their farms and they perceived benefits from reduced emissions they would likely adopt these systems and GHG emissions would be reduced.
36. **Goal Statement: IF** farmers in Colombia’s agricultural sector adopt climate-resilient and low-carbon practices, **THEN** they will be able to improve their well-being while increasing their resilience and adaptability to climatic threats while reducing the agricultural sector’s GHG emissions, **BECAUSE** farming systems with improved competitiveness will be able to provide and sufficient and stable availability of quality food, by strengthening climate risk management while expanding sustainable management of farmland and natural resources.
37. **Outcomes.** To reach the overall project goal, there are four expected project outcomes: i) The targeted productive agricultural value chains have greater strengthened adaptive capacity and reduced exposure to climate risks ; ii) Increased generation and use of climate information in decision-making; iii) Improvement in the well-being of producer families and socio-environmental sustainability of Colombian agriculture; and iv) Improved management of land in agricultural areas contributing to GHG emissions reductions. Each of these outcomes is aligned with GCF results areas and Fund Level impacts as outlined in Section E. More specifically, outcomes (i) and (ii) are aligned with the “increased resilience and enhanced livelihoods of the most vulnerable people, communities and regions”; outcome (iii) is aligned with the “increased resilience of health and well-being, and food and water security”; and outcome (iv) is aligned with the “reduced emissions from land use, reforestation, reduced deforestation, and through sustainable forest management and conservation and enhancement of forest carbon stocks”. It is also worth noting that there is causal relationship between outcomes, where the increased generation and use of climate information in decision-making (Outcome 2) could lead to greater strengthened adaptive capacity of the targeted value chains (Outcome 1). At the same time, the greater adaptive capacity and reduced exposure to climate risks of the targeted value chains (Outcome 1), the increased generation and use of climate information in decision-making (Outcome 2), and the improved management of land in agricultural areas (Outcome 4) could lead to the improvement in the well-being of producer families and socio-environmental sustainability of Colombian agriculture (Outcome 3).
38. **Results.** The project outcomes are sustained by a series of project results. Specifically, under **Component 1**, a strengthened and modernized agricultural extension system oriented towards adaptation and mitigation (Result 1.1, with the support of Results 3.1 and 3.2) will result in the adoption by farmers and farmer associations of digital agriculture for improved decision making for climate change adaptation and mitigation in the targeted value chains, resulting in greater climate resilience and adaptability to extreme weather events and climate change (Outcome 1). The establishment and/or strengthening of agroclimatic services in the selected value chains (Result 1.2, with the support of Results 3.1 and 3.2) will result in increased generation and use of climate information in decision-making by farmers and farmer associations (Outcome 2), the greater resilience of the targeted agricultural value chains (Outcome 1) and the improvement in the well-being of producer families (Outcome 3). Under **Component 2**, the strengthened germplasm bank, development of new varieties and massive seed distribution (Result 2.1, with the support of Results 1.1, 3.1, and 3.2), would result in the adoption by farmers and farmer associations of new climate smart practices, technologies and varieties that will support Outcomes 1, 3 and 4. With site specific crop management techniques and other technological options validated (Result 2.2, with the support of Results 1.1, 3.1, and 3.2), the project will result in more efficient use of water resources, restoration of soil properties, and improving GHG mitigation practices by farmers and farmer associations for improved management of land in agricultural areas contributing to GHG emissions reductions (Outcome 4). Under **Component 3**, improved business models that

provide farmers with reasonable profits and help them adopt climate mitigation actions (Result 3.1) will contribute to Outcomes 1, 2, 3 and 4. The modernized technical assistance and agricultural extension services with multi-tool strategies, differentiated and adapted to specific environmental, social, gender and productive contexts (Result 3.2) will result in strengthened institutional capacity through trained producers, technicians and producers associations with the information to improve management and adopt climate mitigation practices and technologies, contributing to Outcomes 1, 2, 3 and 4.

**Figure B.2.1. Theory of change of the CSICAP Project**



39. **Gaps and barriers.** Based on the expected project outcomes, and results, the project, through its activities, addresses barriers that at the moment lead the agricultural sector of Colombia towards a development path that is not sustainable. The project seeks to change production practices and technologies in the Colombian agricultural

sector towards a sustainable use of resources (water, soil, agricultural inputs, etc.), while developing and implementing management practices of cultivation and agricultural technologies that increase resilience to climate change (e.g., droughts and floods). In the context of the adaptation and mitigation needs presented in section B.1, the barriers that will be addressed by the project and that will allow the change in the development trajectory of the Colombian agricultural sector are:

40. i) Limited capacities of agricultural extension services and local farmers to collect, manage and systematize data to generate site and time specific advice for good management practices under climatic conditions induced by climate variability and change. There is limited basic information or analytical capacity, and the deficient technical assistance system prevents the expansion of this type of program. Information and data collection and analysis is required to generate a site-specific agricultural platform for certain crops. Currently there is a follow-up and monitoring of manual cultivation, depending mainly on the face-to-face assistance of technicians or the producers themselves, where there are difficulties in making climate-smart decisions with precision, site-specific and on time. There is limited capacity in the recording and management of information for climate-smart decision making, where there are gaps in the capture, analysis and dissemination of information. At the same time, there is reduced coverage of technical assistance, with little use of digital media to disseminate climate information, and a lack of capacity in digital agriculture and data analysis with machine learning (ML) and artificial intelligence (AI). There is a lack of resources in the producer groups to promote training programs for technicians and producers, especially in the use of tools in data analysis.
41. ii) Limited knowledge and ability to properly use agroclimatic information for local decision-making's processes to respond timely to climate risks and hazards induced by climate variability and change. Currently, there are gaps in meteorological monitoring and the climate predictions that are generated are little contextualized and are not local in scale. At the same time, the agroclimatic models have not been properly developed, where there is a lack of basic information, calibration or evaluation; the climate-production system relationship, the variables and critical moments within the crop cycle are not well understood. The application and use of agroclimatic information projections are limited by the lack of capacity in agricultural advisory services and inefficient dissemination mechanisms to include new regions within the existing platform (corn, coffee, potatoes), the lack of characterization of climatic threats (potato, livestock), the lack of resources to calibrate crop models with agroclimatic projections and / or the lack of knowledge to calibrate said models (rice, corn, sugar cane).
42. iii) Limited access to and knowledge of genetic resources and their tolerance to climate variability and change by local farmers and producers. There is limited knowledge on direct measures for the development of hybrids and varieties adapted, evaluated and selected to tolerate extreme climatic conditions of drought and waterlogging, as well as diseases. In the case of forage species in livestock, there is low biomass productivity due to phenomena associated with climate variability such as droughts and floods. At the same time, there is little or no availability of improved seeds to increase adaptation to climate change and a need to expand the production capacity and supply of planting material.
43. iv) Limited knowledge of water footprint and water use efficient technologies to promote behavioral changes that contribute to a better use of water resources, particularly under stress conditions. There is no information on the water footprint of the different technologies and, therefore, there is no certainty about the technologies with the lowest water footprint that can be applied in the different regions. There are some technologies and information for less water use, but there is no scaling-up strategy for these technologies.
44. v) Limited knowledge of carbon footprint at crop and technology level to promote a large-scale adoption of low-emission practices. There is no information on the emission levels associated with different crop technologies, the variations in greenhouse gas emissions due to genetics are not known, and low carbon technologies have not been identified and quantified. There is no mitigation plan or strategy at the crop level. There is a lack of information and dissemination on low-carbon technologies at the commercial level and with strong scientific support on the mitigation potential. The costs of this type of analysis are high and there is no budget to carry out this type of studies. Likewise, farmer groups have limitations to carry out this type of study on their own.
45. vi) Weak/vulnerable business models and lack of tailored financial instruments. As climate change and variability increase the risk for investing in the agricultural sector, key actors of the agricultural sector (farmers, gremios' technicians, and other sector entities) have limited technical capacities and dealignment with the digital age to both transfer and understanding relevant knowledge to reduce climate risks across their business models. Many of the business models of the farmers do not include elements necessary to scale up to profitable, climate resilient low carbon production systems that are well integrated with wholesale and retail markets, with special attention given to product differentiation that are climate friendly. Farmers are poorly linked with other actores in the value chain to mitigate climate change and reduce GHG emissions. Moreover, agricultural sector stakeholders lack of tailored financial instruments and products that can support de-risking strategies, which is often due to the lack of knowledge, information, and active involvement of financial institutions regarding the efforts made by agricultural sector stakeholders for a climate-resilient and low-carbon agricultural production system. A further impediment to innovation is that the first mover takes the risk of failure, but if he succeeds the knowledge produced is a public good. Hence, it is fair for public or quasi-public funds to be used to underwrite risk taken with novel technologies.

- This is particularly necessary with the adoption of GHG reducing technology that produces a public good and may not produce any benefit for the initial adopter.
46. vii) Weak extension services based on linear model that provides blanket recommendations rather than site and time specific guidelines. Gremios that are a striking feature of the major crops in Colombian agriculture were all formed long before the digital age. They and the agencies that provide services to the growers have mostly remained with highly centralized structures that pay relatively little attention to variation over space and time of the industries they support. Thus, farmers frequently receive blanket recommendations for their crops from the extension services and often have a minimal say in the overall strategies and management of the powerful growers' associations that represent them. In addition, in some cases, required inputs such as biological control agents for a climate resilient sound agriculture are not available. As a result, there is limited technical and institutional capacities to adopt and scale up climate smart technologies in agricultural production. Farmers experiences and knowledge are not shared, and power of gremios is not effectively utilized.
  47. viii) Limited knowledge of contributing factors to climate smart agricultural technologies uses and adoption by farmers in the targeted value chains. Despite continued research in the adoption of climate smart technologies in agricultural production systems, there are still knowledge gaps in terms on what mechanisms and what influence some of these technologies may have in reducing climate vulnerability and GHG emissions.
  48. ix) Limited access to productive factors and participation in labor and decision-making process by women and young farmers. Housework and unpaid care work are activities that fall on rural women, which considerably limits their labor participation and permanence in the paid labor market and decision-making in farming units. Additionally, women farmers and ranchers have less access to productive factors, such as land, credit and technology, which reduces their production potential in crop chains, and limits local economic development. Additional details are described in the Gender Assessment (Annex 8).
  49. x) Limited adoption of good practices to reduce environmental risks in at risk areas. There are risks of in paramo ecosystems of agricultural reconversion, especially when it comes to livestock activities. There is a need to implement measures to reduce the use of agrochemicals, and that farmer associations review the existing protocols of agrochemical use to promote greater adoption of good practices, in such a way that environmental risks can be reduced. in human health. Further details are described in the Social and Environmental Risk Assessment (Annex 6).
  50. **Project activities to overcome barriers and catalyze transformational change.** Based on the identification of the barriers, this project develops three Components, six results and their respective activities to reduce or eliminate these barriers (see diagram of Theory of Change and Table B.2.1). Specifically, the **barrier (i)** of limited capacity for analysis and information management in agricultural extension services will be addressed by **Result 1.1** that seeks to modernize and expand the coverage of agricultural extension services in Colombia by training technicians in the management of digital tools so that the recommendations of the technicians to the producers are reliable, timely and specific by site, resulting in agility and lower cost for the provision of agricultural extension services. The activities of Result 1.1 will be coordinated with the activities of Result 3.2 (capacity building and knowledge transfer), which is transversal to Components 1 and 2.
  51. In the case of **barrier (ii)** of limited use and adequate application of agroclimatic information, it will be addressed by **Result 1.2** of agroclimatic information services, which seeks the design and/or strengthen agroclimatic information services for the various agricultural value chains. In this case, it seeks to expand the coverage of agroclimatic information services for new production systems (potatoes, sugarcane, livestock, bananas and plantains) and strengthening of existing agroclimatic information services which function independently in rice, corn, sugarcane and coffee. These activities will be coordinated with Results 1.1 and 3.2. As a result of the activities under Component 1, the agricultural value chains are expected to have greater resilience and adaptability to extreme weather events and impacts of climate change, which translates into lower losses compared to expected and/or historical scenarios. similar for each activity. This will improve the well-being of producer families and the socio-environmental sustainability of Colombian agriculture.
  52. **Component 2** seeks the massive implementation of technologies and crop management options that allow improving the resilience of productive systems and low-carbon agricultural development, considering alternatives for genetic improvement, efficient use of water resources, soil and other adaptation and mitigation options. In this case, the **barrier (iii)** of limited knowledge of genetic resources and their tolerance to climate variability will be addressed by **Result 2.1**, which seeks to strengthen the germplasm bank, the development of new varieties and massive multiplication of seeds adapted to conditions. extremes of precipitation and temperature and/or that lead to a lower emission of greenhouse gases. **Barrier (iv)** of limited knowledge about the water footprint and water efficient technologies and **barrier (v)** of limited knowledge of the carbon footprint at the crop and technology level will be addressed by **Result 2.2** which focuses on the development and scaling of crop management techniques and other low-carbon and climate-resilient technology options, in coordination with Components 3.1 and 3.2. As a result, it is expected that these improved practices and technologies will be implemented together with the farmer groups, which would result in the strategic agricultural production value chains for the country with greater productivity, sustainability and adaptability to climate change.

53. **Component 3** seeks to facilitate the strengthening of agriculture business models by enabling ownership, transfer and use of the knowledge generated in components 1 and 2 through innovative, inclusive and digitally enabled approaches for meeting farmers needs and by actively involving financial institutions to understand *gremios* and farmers efforts to de-risk agricultural production systems and incentivizing them to use project's information to inform the development of tailored financial instruments. Hence, **barrier (vi)** will be addressed by **Result 3.1** through which business models in prioritized value chains will be analyzed to identify opportunities to engage with potential buyers in climate-resilient and low carbon markets, while involving financial institutions; **barrier (vii)** will be addressed by **Result 3.2**, which will allow *gremios* to improve their knowledge transference using innovative, inclusive, and digitally enabled approaches. Finally, **barriers (viii), (ix) and (x)** will be addressed transversally by Components 1, 2 and 3, as they implement related activities to gender, social and environmental issues, as well as impact evaluation of project activities.
54. **Risks.** Among the identified risks for this project is that farmers and ranchers tend to be very conservative when adapting to new technologies, varieties or crops, presenting a very important but passive resistance to the introduction of new profitable procedures or systems. There are also possible incorrect design or management of field trials, failures in partnership agreements or institutional settings that may hinder the transfer and adoption of crop technologies. Potential issues regarding local governance or mechanisms that may limit sustainability of the interventions. Delay in planned scheduled works, including the acquisition of inputs, human resources, materials and tools. Finally, the project will carry out activities in remote areas with difficult access, which represents a risk for the execution of the project in terms of delays and costs. This also poses potential issues related to use of site and time specific information and internet connectivity and coverage, especially in remote areas with low connectivity.
55. **Assumptions.** It is noteworthy that the project outcomes will be achieved through implementation of the project activities under the assumptions of: i) Farmers remain interested and actively participate in project activities; adopt technological packages and best management practices; ii) Key stakeholders such as farmer associations and organizations are effectively engaged, support the initiative and are willing to participate, and the capacities created in the farmer associations are maintained and renewed periodically; iii) Technicians participate in the training activities, and develop activities where they can share their knowledge; iv) Trainings and farmer-to-farmer exchanges are effective/sufficient to enable and speed up the adoption of low carbon climate-resilient agriculture practices; v) Agro-climatic information generated is received effectively by farmers, which maintains farmers' interest in actively participating in the project. Farmers attend the trainings and know how to use the information; vi) technologies, tools, and strategies are available and respond to the needs of the sector; vii) The information is disseminated and the organizations / institutions are able to access it; and field activities for variety development are not delayed by severe weather events.

### B.3. Project/programme description (max. 2000 words, approximately 4 pages)

56. **Project components.** The project comprises three interconnected components and their respective activities aimed at reducing the vulnerability of agricultural production to climatic threats and the use of resources (water, fertilizers, energy): 1) Digital agriculture and climate services for rural modernization with an emphasis on adaptation and mitigation; 2) Genetic improvement, crop management techniques and other technological options and their scaling-up to increase resilience and promote low-carbon agricultural development; and 3) Innovative and inclusive business models through modernized innovation systems and a more engaged financial sector.
57. **Component 1. Digital agriculture and climate services for rural modernization with an emphasis on adaptation and mitigation.** This component includes the design, assembly, implementation and operation of climate information services for technicians and producers. The objective is to improve decision-making at the producer level and avoid crop losses. As can be seen in Figure B.2.1, this component includes early warning services on climate hazards, as well as other sophisticated warning systems on pests, diseases and other abiotic factors that can occur due to climatic phenomena. It also includes comprehensive territorial planning systems. Big data analysis, technological platforms and other digital agriculture tools will enable combining climate information with biophysical and agronomic information to select the most recommendable adaptation measures for producers. It foresees two main results: (i) Improved and inclusive decision making by farmers and *gremios* for climate change adaptation and mitigation in targeted value chains through the adoption of digital agriculture and, (ii) Increased adoption and improved use by farmers and *gremios* through of climate services.
58. **Result 1.1. Strengthened and modernized agricultural extension system with an emphasis on adaptation and mitigation.** The project seeks to modernize and expand the coverage of agricultural extension in Colombia for improved and inclusive decision making by farmers and *gremios* for climate change adaptation and mitigation in targeted value chains through the adoption of digital agriculture. As a result, more than 2,200 technicians will be trained in using this type of tools and technicians' recommendations to producers will be reliable, timely (available when required) and site-specific, thereby resulting in a more agile and less costly provision of agricultural extension services. Deliverables under this component will include the design, assembly, implementation and operation of seven (7) Big Data platforms to supply analyzed and processed information that considers user's social, ethnic and

gender differences, and the empowerment of producer associations to deliver recommendations on adaptation and mitigation measures to producers. It is considered that rice, coffee and sugarcane crops are the most advanced in implementing these practices, while livestock and maize are close behind and banana, potato and panela cane are the least advanced in this sense. This is why different activities will be carried out depending on the different crops and producer associations. For livestock and for potato, banana and plantain crops, this platform will be fully implemented. In the case of panela sugarcane, the SRIA platform for information collection is currently available. Therefore, the scope will be aimed at improving and expanding information-collection processes, setting up the information processing and analysis system and developing the system to produce outputs. In the case of rice and maize, the output will be aimed at improving Big Data platforms, expanding information, updating and improving information processing algorithms, with special emphasis on generating platform-based outputs. In the case of sugarcane, a Big Data system is already operating, and therefore, it will be complemented with necessary information-collection instruments related to some variables, including water availability for cultivation<sup>5</sup>.

59. In all cases, the Big Data platforms will be administered by the producer associations and AGROSAVIA, in an effort to promote the adoption and use of these instruments as inputs for the National Unified Agricultural and Rural Information System, without generating additional and permanent long-term costs for the national government (this aspect will be clearly defined in the different implementation agreements with the strategic partners (research institutions and gremios). This Result will be under the leadership of the Digital Inclusion team of the CIAT-Bioversity Alliance. This team will coordinate implementation with the producer associations' teams and AGROSAVIA. It includes the following activities:

- Activity 1.1.1. Organize the information from the different repositories and producer association databases (public and free-access systems) to connect them with updated information available from existing free-access platforms through remote sensing or other sources. This includes: i) developing a data collection strategy linked to environmental, social, technological, productive and economic indicators and local knowledge; ii) developing a protocol to integrate databases with existing crop information; iii) processing and cleaning information in the databases; iv) consolidating processed information in a database management system; v) analyzing data using machine learning and computational optimization methods; vi) disseminating results in workshops or field days.
- Activity 1.1.2. Develop a bot-based digital instrument to strengthen the extension service. There are plans to develop communication tools that facilitate human-machine interaction to provide automatic answers to frequently asked questions in conversations between farmers and technicians. This will facilitate sharing the recommendations derived from data analysis, as well as agroclimatic forecasts. This includes: i) testing pattern recognition models in texts that producers and technicians have exchanged; ii) engaging with potential users of different sex, age, cultural and socioeconomic backgrounds to collect a baseline of the information more frequently required for decision making, as well as the most frequently used information channels. This will be done through workshops, interviews, questionnaires and possibly focus groups; iii) creating an automatic wizard to exchange agroclimatic information with producers, through chats or text messages on planting dates, choice of varieties and rain forecasts, among others.
- Activity 1.1.3. Design and develop the entire data mining and analysis operating system that will allow interconnecting all available information. In turn, systems will be developed to enable the automatization of analysis and modeling processes, in an effort to encourage more robust recommendations and more agile and efficient processes. This includes: i) monitoring the crop cycle using remote sensors (satellite images and drones) and non-remote sensors (soil moisture sensors, electroconductivity, leaf moisture sensors); ii) establishing field and flight sensors to capture images using drones; iii) designing a data management system that allows searching for information, downloading and processing it; iv) analyzing the information and validating and disseminating the results.
- Activity 1.1.4. Train technicians in the use and application of advanced data analysis methods, including: i) holding in-person and virtual training workshops, and short-term stays of professionals from producer associations at CIAT and other centers of excellence, to develop skills in the use of data mining, evolutionary computing and remote sensors to generate information for decision-making in the field; ii) Developing, validating and implementing a module based on graphical interfaces to facilitate data analysis and consultation, aimed at producer association technicians; iii) Training of trainers on Information Literacy for producers with an ethnic and gender focus and develop and implement dissemination means, including communication platforms. This seeks to expand the number of users served under Activities 1.1.1 and 1.1.3.

60. Result 1.2. Agroclimatic services in place and/or strengthened. This will support the increased adoption and improved use by farmers and gremios of accessible climate services and information to reduce agroclimatic risks. As a result, the project will allow to provide timely and reliable information to more than one million users (considered indirect beneficiaries) on the main climatic threats and crop management recommendations to avoid losses. The

<sup>5</sup> In the case of coffee cultivation, the currently available SICA system handles a good volume of variables and therefore, it was not included in this component. Nonetheless, information from the SICA system will be analyzed in other components of this project.

Project will ensure technical support in the implementation of adaptation and mitigation measures to about 49,200 of these producers, who are considered direct project beneficiaries. The project will follow-up on these beneficiaries and will evaluate<sup>6</sup> results achieved. This component includes the design and implementation of early warning platforms that provide accurate and timely information to farmers by generating climate predictions, using simulation models and Big Data information. A platform for climate services in rice and maize crops is currently operating. It was designed, installed and put into operation as part of the pilot carried out in the context of the MADR-CIAT agreement. Platforms for the cultivation of sugarcane and coffee operate independently.

61. A first step in this activity is to expand the coverage of services to other crops (potato, panela sugarcane, livestock, banana and plantain), and this requires purchasing, installing and calibrating equipment to measure and record climatic and related variables. Data collection, storage and analysis, climate predictions, crop modeling, climate-crop integration, process automation and an information query platform are also required. Information systems will be strengthened with new-generation models and improved performance of climate predictions and crop modeling. Likewise, for some crops, there will be a transition towards new alert services related to pests, diseases, abiotic factors and water use planning in irrigation systems. In this case, it is necessary to move forth in developing, calibrating and validating pest and disease behavior modeling, and hydrological modeling at the supply basin level.
62. This Result will be under the leadership of the Climate Action team of the CIAT-Bioversity Alliance, which will coordinate its implementation with the producer associations' and Agrosavia's teams. It includes the following activities:
- Activity 1.2.1. Design and/or strengthen agroclimatic information services. It seeks to expand the coverage of information services to reduce the agroclimatic risk for new productive systems (potatoes, panela sugarcane, livestock, banana and plantain) and strengthen existing agroclimatic information services which function independently for rice, corn, sugarcane and coffee. Under this activity, the deliverables include four (4) improved agroclimatic platforms with better forecasting performance (sugarcane, coffee, rice and maize) and five (5) new agroclimatic platforms in operation (potato, panela sugarcane, livestock, banana and plantain). This includes: i) evaluating climate forecasts at different time scales (e.g., seasonal, sub-seasonal) and developing a protocol for the use of climate information; ii) Developing a network to collect climate information (meteorological stations network) in already selected prioritized sites;<sup>7</sup> iii) Identifying and mapping areas that are vulnerable to experience water and biological stress, based on their water supply; iv) creating, structuring and implementing the Cenicaña AgroClimate Service for the Cauca River Valley, including the automation of the productivity prediction system for sugarcane and the analysis of climatic variables; and v) adjusting and validating climate prediction models in coffee and its relationship with diseases, and making recommendations.
  - Activity 1.2.2. Develop more accurate and precise climate and weather prediction models and complementary improved crop simulation models by using new-generation climate models, improving the performance of climate prediction models, modeling crop physiological processes, including alerts for pests, diseases and other abiotic factors (for example, frosts), and irrigation planning and optimization.
  - Activity 1.2.3. Connect agroclimatic forecasts with artificial intelligence models (Result 1.1). This includes: i) integrating agroclimatic forecasts in the design and implementation of early warning platforms that use climate forecasts, simulation models and Big Data information to provide accurate and timely information to farmers and technicians; ii) Usability tests with producers of agroclimatic platforms and mass dissemination systems; iii) Adjustments in outputs and generation of new services based on needs; iv) Generation of visualization interfaces targeted at different users according to agroclimatic information needs.
  - Activity 1.2.4. Strengthen mechanisms to disseminate agroclimatic information and transfer capacities. Ensure the operation of at least 15 **Agroclimatic Technical Working Groups (MTA)**, with diverse representation, and provide training for their members and other actors in order to strengthen the dissemination of climate services to technicians and producers in other crops, considering the different needs, interest and constraints of different types of producers. Moreover, develop content and circulate recommendations through diverse media and dissemination mechanisms and tools (including digital tools) in order to reach one million users. This includes generating agroclimatic information and including it in the AclimateColombia ([www.aclimatecolombia.org](http://www.aclimatecolombia.org)), SIPA (sugarcane), and ASISTEGAN (livestock) platforms.
  - Activity 1.2.5. Other activities related to producing, transferring or using agroclimatic information (automation of meteorological information, analysis of climate change signals, nutrient balance models). In the case of sugarcane, the analysis of meteorological information and climate forecasts will be automated, allowing early decision-making to mitigate the effects of climate variability on production. Similarly, the producer association plans to study the signs of climate change and climate forces in the Cauca River Valley, to produce information to mitigate the climate change effects in the entire value chain of the sugarcane industry. In the

<sup>6</sup> Monitoring and evaluation will be carried out as part of the impact evaluation component and will focus on a representative sample of these producers.

<sup>7</sup> See Appendix 3 in Annex 2.

case of coffee, there is a proposal to use the information generated by Cenicafé and new research to model nutrient input and output in coffee production systems in the context of climate variability. Finally, in the case of rice, there are plans to evaluate the water balance and fertilization modules of the rice cultivation models, in order to expand their application in decision-making and in the optimization of natural and agro-industrial resources.

63. **Component 2. Genetic improvement, crop management techniques and other technological options and their scaling-up to increase climate resilience and promote low-carbon agricultural development.** This component comprises technologies and crop management options to improve the resilience of productive systems and promote low-carbon agricultural development, and considers alternatives for genetic improvement, efficient use of water resources and soil, and other adaptation and mitigation options. This component considers two thematic Results with their corresponding results and activities as described below:
64. Result 2.1. Strengthened germplasm bank, new climate resilient varieties developed and their seeds massively distributed. This will allow the adoption by farmers and gremios of new climate smart practices, technologies and varieties. As a result of this activity, more than 123,000 hectares will implement the practices, technologies and varieties proposed by the Project. This component includes developing a state-of-the-art phenotyping platform designed to identify climate-resistant genetic resources<sup>8</sup> aimed at developing heat- and drought-resistant, nitrogen-use efficient and low-GHG emission accessions for rice, maize, bananas, sugarcane, panela sugarcane, coffee, potatoes and livestock.
65. This component will be under the leadership of the Crops for Nutrition and Health team of the CIAT- Bioversity Alliance, which will coordinate implementation with the producer associations' and Agrosavia's teams. It includes the following activities:
- Activity 2.1.1. Develop a state-of-the-art phenotyping platform designed to identify low carbon production and climate-resistant genetic resources. It will initially be tested and validated with beans. Once the tests have been carried out, the platform will be made available to rice and livestock (forages). This includes: i) Installing, calibrating and testing growth chambers designed to simulate future climatic conditions by manipulating lighting, temperature and relative humidity; ii) Installing and testing field equipment that supports the capture of sensor images and data; iii) Calibrating and testing cameras and sensors to quantify the impact of abiotic stresses on photosynthesis; iv) Sequencing of parental genetic material and/or progeny; v) Application of a genomic selection model.
  - Activity 2.1.2. Identify heat, drought and excess water tolerant accessions for rice, maize, potatoes, Musaceae, and livestock (forages), including: i) Detecting physiological traits using the phenotyping platform described in Activity 2.1.1; ii) DNA sequencing to identify regions of the genome that control the traits assessed; iii) Identify traits to increase crop resilience; iv) Selection and evaluation under controlled conditions for water deficit, low nitrogen and waterlogging of elite parental lines.
  - Activity 2.1.3. Develop new varieties from advanced lines for climate change adaptation and mitigation for rice, maize, livestock, banana (varieties that are tolerant or resistant to water deficit and diseases that demand high use of chemical fungicides, such as black Sigatoka) and sugarcane (water deficit, waterlogging and greater efficiency in nitrogen use). This includes: i) selecting and evaluating advanced varieties under controlled conditions (greenhouse, laboratory) that simulate climate change environments: water deficit, salinity, low nitrogen, waterlogging; ii) Genetic characterization and creation of the elite parents bank; iii) New crosses with promising lines; iv) Validation and performance evaluation of materials developed in other countries but that have not been tested in Colombia; v) Selection of lines with better performance; vi) Evaluation of greenhouse gas emissions of different genetic materials; vii) Materials registration process and release of new materials.
  - Activity 2.1.4. Massive seed multiplication for coffee, sugarcane, panela sugarcane, potato, banana and plantain through in vitro culture or the buds method for distribution to farmers. The application of techniques to massively multiply outstanding variety seeds and the design of a gender-responsive delivery strategy (including the collection of gender-differentiated feedback on the new varieties), thereby allowing for large-scale adoption of the varieties developed throughout the Project. This includes establish a thermotherapy protocol, clean by cryopreservation, multiplication of the material, detection of virus and diseases, implementation of the in-vitro technique of Somatic Embryogenesis (SE) and implementation of bioreactors for scale up.

<sup>8</sup> Seed multiplication is a very heterogeneous process that varies per crop. For example, for rice the certified seed market (40-65% of the cultivated area) is mostly represented by four producing companies (FEDEARROZ, Semillano, Semillas Huila-Pajonales). For **corn** seeds, the main actors are transnational companies (Pionner, Monsanto, Syngenta, Advanta), Fenalce and Semivalle. Fenalce receives the support of international entities such as CIMMYT. In the case of **potatoes**, is mostly grown on the basis of informal seed with only 5% of the total area planted using certified seed. In **sugarcane**, there is no private market for seed, and producers, through their associations, are responsible for all research. In **coffee**, the National Coffee Research Center (CENICAFE) is in charge of an improved seed production system. For **bananas**, the seeds come from in vitro cultivation, a high percentage of which are distributed by the company Rahan Meristem.

66. Result 2.2. More efficient use of water resources, restoring soil properties, and improving GHG mitigation practices by farmers and gremios through the adoption of new climate smart practices and technologies. This component seeks to support crop management techniques and other technological options and their scaling-up to increase resilience and mitigation in the targeted value chains for different types of farmers. This considers the validation and incorporation of sustainable production practices that allow more efficient use of water resources, restoring soil properties, reducing GHG emissions or increasing carbon capture, while enabling productivity increases. As a result of these interventions, more than 9,230 hectares will implement the technologies, of which 8,750 benefit the reduction of GHG emissions. It is expected that there will be a reduction of 432,297 tons of CO<sub>2</sub>e during the project lifespan, at a rate of 18,796 tons of CO<sub>2</sub>e per year.
67. Under this component, sustainable management practices will be formulated and implemented at a large scale. These include the incorporation of rational use of fertilizers and bioproducts (potatoes, maize, rice, panela sugarcane, banana, plantain and coffee), optimization of irrigation systems (rice, potato, plantain and banana), conservation agriculture (potato and maize), use of harvest residues (coffee, maize, banana), low-emission planting materials (rice and sugarcane), optimization of processing systems (panela, and coffee), water harvesting (rice, panela, coffee and plantain), enclosures of riverine corridors and assisted restoration (for sugar cane), enclosures of biological corridors, riverine corridors, living fences, intensive and non-intensive silvo-pastoral systems, pasture rotation, scattered trees in pastures, and hedges fodder (for livestock). This component will be under the leadership of the Multifunctional Landscapes team of the CIAT-Bioversity Alliance, which will coordinate implementation with the producer associations' and AGROSAVIA's teams. It includes the following activities:
- Activity 2.2.1. Quantifying the baseline water footprint in six (6) crops (potato, sugarcane, panela sugarcane bananas, plantains, and livestock) and in the industrial phase of sugar production. This includes: i) Designing and selecting experimental plots; ii) Installing monitoring sensors; iii) Measuring water balance and water quality, iv) Quantifying the water footprint and identifying critical points of high water consumption.
  - Activity 2.2.2. Quantifying the baseline carbon footprint for seven (7) crops (rice, potato, sugarcane, panela cane, bananas, plantain, and livestock), fertilizer use and industrial processing in sugarcane cultivation. This includes: i) Collecting information on activities in cultivation and transformation processes; ii) Building a database with emission factors in cultivation and manufacturing; iii) Quantifying the carbon footprint and identifying the critical points.
  - Activity 2.2.3. Hydrological modeling of basins to identify water harvesting points in rice, panela cane, bananas, and coffee production systems. This includes: i) Collecting spatial and hydroclimatic information in the basin; ii) Designing and validating with men and women farmers of different ages and socioeconomic backgrounds the hydrological model and creating scenarios of changes in coverage and climate forecast; iii) Mapping, identifying and validating water harvesting points; iv) Generating water conveyance routes; v) Building water reservoirs (in the case of panela cane, plantain and coffee); vi) Training workshops for professional associations' staff (e.g. agricultural engineers); vii) Efficient planning of water uses at the level of irrigation districts.
  - Activity 2.2.4. Evaluation of efficient water use practices in agronomic management and transformation processes (e.g., milling of panela cane) in potato, panela cane, plantain, banana, coffee crops and livestock. This includes: i) Identifying and formulating agronomic management practices and industrial transformation; ii) Selecting and implementing conventional productive plots with efficient use practices; iii) Installing equipment to monitor moisture balance; iv) Creating moisture balance and monitoring water quality; v) Quantifying the water footprint in conventional systems and efficient water use practices; vi) Training workshops for producers on monitoring and managing efficient water use systems.
  - Activity 2.2.5. Evaluation of GHG emission mitigation practices in agronomic management and transformation processes in rice, maize, potato, panela cane, plantain, banana, coffee, sugarcane crops, and livestock. This includes: i) Identifying productive typologies considering gender and socioeconomic related variables; ii) Implementing productive plots to monitor conventional systems and practices with mitigation potential; iii) Collecting information regarding activity data; iv) Installing and monitoring static cameras to collect soil-released GHG samples; v) Generating emission factors; vi) Quantifying the carbon footprint in conventional systems and systems with practices with mitigation potential; vii) Training workshops for producers on monitoring and managing practices with mitigating potential.
  - Activity 2.2.6. Landscape restoration in sugarcane cultivation and livestock systems. The activities that will be developed include enclosures of riverine corridors and assisted restoration (for sugar cane), enclosures of biological corridors, riverine corridors, living fences, intensive and non-intensive silvo-pastoral systems, pasture rotation, scattered trees in pastures, hedges fodder (for livestock). Under this activity, the project will support with: i) Prioritizing activities and identifying potential intervention areas and landscape units through inclusive participatory processes; ii) Using a nursery for the propagation of native species targeting the engagement of women farmers; iii) Coverage mapping; iv) Implementation of the identified interventions.

- Activity 2.2.7. Massive implementation of agronomic management technologies and transformation processes that enable more efficient use of water and promote low-carbon development in rice, maize, potato, sugarcane, plantain, banana, and livestock production. This includes: i) Identifying production typologies and selecting producers for implementation; ii) Training producers and other actors in the implementation and management of sustainable production practices including targeted trainings for women climate resilient agriculture focused on the tasks they perform within each crop/chain (e.g. seed selection, diversification of crops, subsistence farming, pre and post-harvest); iii) Co-designing systems to be implemented through inclusive participatory processes with producers; iv) Generating dissemination material suitable for different types of farmers; v) Implementing sustainable systems/practices at the regional level.
68. **Component 3. Innovative and inclusive business models through modernized innovation systems and a more engaged financial sector.** The generation, massive transfer and scaling-up of technological options require modernized innovation systems to permanently support relevant cross-cutting issues to ensure that: (i) technological options enable the development of innovative business models that mainstream its benefits over time across key agricultural sector stakeholders, including financial institutions; (ii) this technological options reach the largest possible number of users through considering the different needs, capacities, knowledge and conditions of the various producer and population groups (women, men, youth, elderly), as well as the different social and environmental contexts, and (iii) the impacts of the project are properly recorded and analyzed.
69. This component aims to support the development of science-based business models and the modernization of innovation systems to reach producers effectively, by enhancing the dialogue between technician-technician and producer-producer through digitally-enabled tools and approaches for sharing knowledge and experiences, and increased awareness of gender-based constraints to the adoption of sustainable production systems and capacities to address these. A key focus of this component is understanding prioritized value chains and use project's results in other components to identify climate-resilient and low carbon markets in which gremios, agri-business and farmers can offer their value proposition and open new commercial opportunities. A second focus of this component is the bringing gremios and different types of farmers to develop modernized innovation systems that incorporate the advantages of the digital era. This modernization involves the strengthening institutional capacities to increase coverage of extension services, which will rely on new knowledge generated by producer association professionals through two-way digitally enabled tools. In this component, the project will closely engage with financial institutions both national and local so that they know and understand the strategies that gremios and farmers will implement for de-risking agricultural investments within the framework of the project, highlighting the need for tailored financial mechanisms and products to enable benefits beyond project's life. The training and capacity-building strategy of this component will contemplate the relationship with the Departmental Agricultural Extension Plans (PDEA), providing support on agro-climatic risk management and climate change adaptation, through information, generation of new knowledge and technology transfer processes. This component will result in two result areas, which are described below with their corresponding activities:
70. Result 3.1. Improved business models that provide farmers with reasonable profits and improved GHG mitigation practices. The agricultural private sector (gremios, service providers and farmers) will increase its capacity to identify novel and inclusive business models. As a result of this component, gender sensitive value chain analysis will be developed for specific cases to identify additional and/or new market opportunities for climate-resilient and low-carbon agricultural products and/or services. With the support of the project's expert team, a strategic plan will be co-developed with the relevant gremios for high-potential opportunities. Through this component, financial institutions will be engaged in four relevant geographic areas in which the MTAs are in place, so that they receive regular information on de-risking strategies implemented in Components 1 and 2 and engage with gremios, service providers and farmers to better understand their needs and opportunities to support the transition towards a more climate-resilient and low-carbon agriculture. This component includes the following activities:
- Activity 3.1.1. Strengthen gremios capacities to use digitally enabled tools that improve the provision of services to farmers with emphasis on profitable production system that also reduce GHG emissions and increase climate-resilience. This activity supports gremios efforts to enhance their extension and knowledge transfer functions by using, inter alia, digital tools to increase the understanding and provide more appropriate response to farmers demands while strengthening processes of allocation of resources to provide services to farmers. These activities are conceptually aligned with an innovation systems approach. This will include: i) Assessment of gremios capabilities and needs, as well as, opportunities to better-inform their allocation of resources (human, financial) to respond to farmers demands and help them to manage climate to their advantage; ii) Co-design of implementation plans for gremios to the decision-making processes to cost-effectively enhance their provision of climate-related services to farmers; iii) Co-develop feedback loop mechanisms to provide information to the gremios to inform allocation of resources/efforts (human, financial) for climate-related services provision to farmers.
  - Activity 3.1.2. Implement inclusive climate-resilient and low-carbon business models for agricultural products and services. Investment by gremios and farmers in low carbon and climate resilient options is expected to reward farmers with tangible benefits, therefore, market opportunities will need to be assessed so that farmers

can explore alternatives to increase their supply, enter specialized markets, increase revenue due to increased added value, among others. This activity will provide technical support and facilitate producer-buyer-consumer to explore these alternatives. This activity includes a gender-sensitive analysis of the value chains and definition of sectoral strategies with a focus on low carbon and climate resilient activities, in addition to the co-design and validation of business models, including: i) Systematization of the results generated by the components of the project on digital agriculture, climate-smart and low-carbon practices to guide its inclusion into business models; ii) Coordinate producers, gremios, buyers and other actors in the value chains, to prioritize opportunities for improvement, as well as address barriers that limit the escalation of climate resilience and low emission practices and the inclusion of women farmers and other vulnerable groups wherever these have been previously excluded, or the recognition and appropriate valuation of their contributions; iii) Design of an escalation strategy (with gremios, producers and other actors) that allows the integration of digital agriculture elements and climate services to the value chains, to increase climate resilience and mitigate GHG emissions; iv) Implement business models for producers and buyers, to enhance climate mitigation practices and evaluate market opportunities for differential products; v) Evaluate changes in the business models of producers and buyers, and identify lessons learned and success factors in scaling up digital agriculture mechanisms and low-carbon practices in the value chains.

- Activity 3.1.3. Enhance financial sector engagement with farmers and their needs and efforts on climate-resilience and climate mitigation activities. This will involve fostering the financial sector to develop tailored financial products that supports gremios and different types of farmers to de-risk agriculture by implementing climate-resilient and low-emissions options. Furthermore, the financial sector is expected to be a user of project's relevant information through digitally enabled tools so as to make better informed financial market decisions based on the specific conditions in time and space. This will include: i) Implementation of a capacity building program to raise awareness of financial sector institutions on mid and long-term de-risking mechanisms that the project will implement throughout its components; ii) Facilitate participation and involvement of financial institutions in the MTAs; iii) Identify opportunities with financial institutions and prioritize cases studies to provide technical support for incorporating climate-resilient and low-carbon criteria to their agricultural financial products.
- Activity 3.1.4. Fostering agri-digital entrepreneurship ecosystems. This activity aims to explore and identify potential opportunities for creating new ventures and transforming existing businesses by developing new digital technologies or experimenting with novel digital services to help farmers and others along the supply chain. This will include: i) Explore and identify potential opportunities for new ventures; ii) support creation of new ventures and transforming existing businesses by developing new digital technologies.

71. Result 3.2. Modernized technical assistance and agricultural extension services with multi-tool strategies, differentiated and adapted to specific environmental, social, gender and productive contexts at the national level.

As part of the overall modernization of the services provided by the growers' associations the technical assistance and transfer systems will be updated. The renovated and up-to-date systems will be built on the principles of sharing information from multiple sources compiled and analyzed in digitally enabled tools and made available to farmers in interactive formats which will facilitate group discussions on the available options. This will result in farmers aware of options for improved management of their crops with emphasis on profitability, efficient use of resources and reduced GHG emissions. As a result of this component, more than 60 sector entities and more than 2,200 technicians (producer associations, sector entities, private sector and students) will be trained in climate change resilience and mitigation (besides the 2,200 individuals trained under Component 1). The scope in this component refers to the increase in the capacities of producers, professionals, institutions and other actors of the productive chains considered in the Project. Strengthening knowledge, encouraging changes in people's attitudes towards technologies or processes, and developing new skills are required to bring about a change in capacities and to ensure that beneficiaries make routine and sustainable changes to their practices. This component also considers using various communication means and defining appropriate language, materials and messages for different types of audiences. This includes the following activities:

- Activity 3.2.1. Foster inclusion of two-way digitally enabled tools for enhancing models for technology transfer technical assistance within an innovations system approach. Updating and implementing strategies to transfer producer associations' technologies and extension services, as well as plans to link producers, organizations and other actors for the project sectors including: i) Linking plans directed by Agrosavia, for Musaceae, potato and panela cane; HUB innovation model applied by CIMMYT for maize; Knowledge Management Model in Sustainable Livestock by Fedegan; Dissemination campaigns of the National Extension Service of the National Federation of Coffee Growers; AMTEC mass adoption model in rice; The technical cooperation and technology transfer service (SCTT) with the network of Technology Transfer Groups (GTT) in sugarcane; Rural School Methodology (ECAS) by Asohofrucol - Musaceae; ii) Exchange of experiences; iii) Use of voice (IVR) and text (SMS) messaging, WhatsApp networks and chatbot; iv) Producer association digital platforms or available mobile applications.

- Activity 3.2.2. Capability development on innovation systems approach and its inclusion into updated technology transfer plans. Standardizing of languages and concepts use for collective knowledge construction and socialization, including: i) Organizing events to disseminate the project and its content; ii) Holding general training events by Result; iii) Work meetings; iv) Written, printed and digital material; v) Videos with project themes; vi) Agroclimatic Technical Working Groups.
  - Activity 3.2.3. Strengthen gremios and farmers capacities on climate adaptation and mitigation and nurture knowledge exchanges across farmers groups. Strengthening the capacities of beneficiaries regarding climate resilience, conducting analyses of the agricultural sector's chains and business models, accompanied by an internal and external communication plan. This includes: i) Specific workshops by topic; ii) Operation planning meetings; iii) Workshops to create procedures, carry out experiments and analyze results jointly; iv) Three Communities of Practice on Digital Agriculture and Data Analysis, Climate Forecasts, and Communication and Outreach; v) Open training courses on specific topics on virtual education platforms; vi) Strengthening academic programs, thesis and internships.
72. Activity 3.2.4. Develop a strategy that allows dissemination, access and use of project results by key public and private stakeholders. This includes: i) Holding management meetings together with national institutions; ii) Preparing executive reports for producer associations on the progress and needs to support service sustainability; iii) Promoting communication through traditional and digital media, social networks, project website; iv) Developing infographics on the Project Identify.
73. Several producer associations and AGROSAVIA have clear and validated strategies for their extension services and technology transfer. It is expected that by the end of the Project, the collaboration between all the producer associations will have strengthened and modernized these services. Analysis at the production chain level and the identification and implementation of business models with a view to promoting technology adoption and supporting the development of differentiated products are also considered. This component will be co-led by CIAT- Bioversity Alliance teams of Sustainable finance, Inclusive Business Models, and Knowledge Management, which will coordinate implementation with the producer associations' and AGROSAVIA's teams.
74. **Selection of beneficiary producers.** The producers participating in the project will be selected in coordination with the gremios based on the vulnerability of each municipality and adaptation needs, as well as other characteristics. The selection process will follow the requirements that the MADR usually determines in the different programs that are developed with public resources. A procedure and schedule will be established for an open call to those interested in participating in the project, holding workshops to publicize the Project, presenting its scope and other relevant information, as well as the procedures and requirements requested and the means of receiving requests. The calls will be socialized with gremios, technicians, local institutions and community leaders from the project intervention areas. During the reception of requests from interested producers, it will be verified that they meet the minimum requirements to participate in the project (e.g., at least 20% of their land in production of the crop from which they wish to receive project support). Once the producers have been selected, they must sign an act of commitment with the MADR to actively participate in the training provided by the project, to make use and application of technology, and to meet other requirements to ensure their participation in the project. For the business model activities (3.1.2, 3.1.3 and 3.1.4) that are focused on other actors along the value chains, the same procedures will be followed. See Appendix 3 in Annex 2 for further details on the selection of beneficiary producers and its procedures and specific requirements following the policies and guidelines from the MADR.

#### **B.4. Implementation arrangements (max. 1500 words, approximately 3 pages plus diagrams)**

75. The Government of Colombia through the Ministry of Finance and Public Credit (MHCP) will be responsible for the reception of project resources, both credit and grant resources from the Green Climate Fund (GCF) as well as CAF financing resources<sup>9</sup>. **The Ministry of Agriculture and Rural Development (MADR)** will be responsible for executing the project resources and technical implementation through its **Direction of Innovation, Technological Development and Health Protection**. In this case, the CSICAP Project is presented as a national initiative under the leadership of MADR which, based on the good results and development of the 2012-2015 pilot experience, considers replicating a similar framework for the implementation of the Project. The Government of Colombia will take loans from both GCF and CAF and will provide grants to the beneficiaries (gremios) given the public goods nature of the interventions (see Figure G.3.1. for the flow of funds of the project). The MADR is the Executing Entity (EE). The MADR will be responsible for the project financial execution and implementation before MHCP and CAF. CAF and the Government of Colombia, through MHCP and MADR, will enter a Subsidiary Agreement for the use of GCF funds. MADR will carry out direct contracting with the International Center for Tropical Agriculture (CIAT)<sup>10</sup>

<sup>9</sup> The MHCP will set up two separate accounts, one for loan resources and another for the grant resources. From these accounts MHCP will disburse to the MADR, as EE, according to the requirements of the project.

<sup>10</sup> The review of CIAT capacities by CAF shows that: i) it is an international non-profit organization with legal status, (ii) it is committed to complying with local laws in all countries where it operates, (iii) its Audit, Finance and Risk Committee - AFRC - receives periodic updates on any risk materialization. Once the different documents were reviewed, it was concluded that CIAT has all the administrative, organizational, financial capacity, and technical to support the implementation of the CSICAP project.

under the Colombian legal framework called the Technical and Scientific Cooperation Agreement.<sup>11</sup> The Government of Colombia, acting through MADR, will retain the final approval authority over any matter/decision adopted by the project cooperation team/any other governance bodies or units. MADR will have the support in the operation of the Project from the Alliance of Bioversity International and CIAT and the producer associations; following the regulations and frameworks defined and allowed by Colombian legislation. These arrangements will be reflected in the agreement signed between the MADR and CIAT. In addition, CIAT will develop a model agreement to be approved by the MADR that will be signed with each of the gremios, including the details of the activities, the co-financing provided by each gremio and commitments acquired at the end of the project for its continuity. At the beneficiary level, and once producers have been selected, they will sign an act of commitment with the MADR to actively participate in the project activities.

76. CIAT, as procured party, will form a Project Coordination Team (PCT) that will be directly responsible for interacting with the Project Executing Unit (PEU) within MADR and responding to its technical and administrative requirements. The project coordination team (PCT) will consist of (1) project leader, (2) a technical associate, (3) a research assistant, (4) a project analyst, (5) a logistics assistant, and (6) two emeritus advisors on technical issues related to climate and agriculture. This team will be responsible for implementing the project and, will guide the six theme leaders and eight crop coordinators. The team will work with the relevant areas of MADR, CIAT, the strategic partners, and any other institution, firm, or person contracted to provide a service or supply a good.
77. This team will be responsible for the project's institutional relations, led by the project leader, and therefore must respond to MADR, who will ensure the proper execution of the project and the adequate use of resources. The team will be responsible for preparing the technical reports and submitting to MADR and preparing the financial report. CIAT, as main procured party, will operate from its hub in the city of Palmira, Valle del Cauca. The whole team of the Project Executing Unit (PEU) will be covered by project resources. The interaction between MADR and CIAT will be carried out through the PEU (MADR) and the PCT (CIAT).

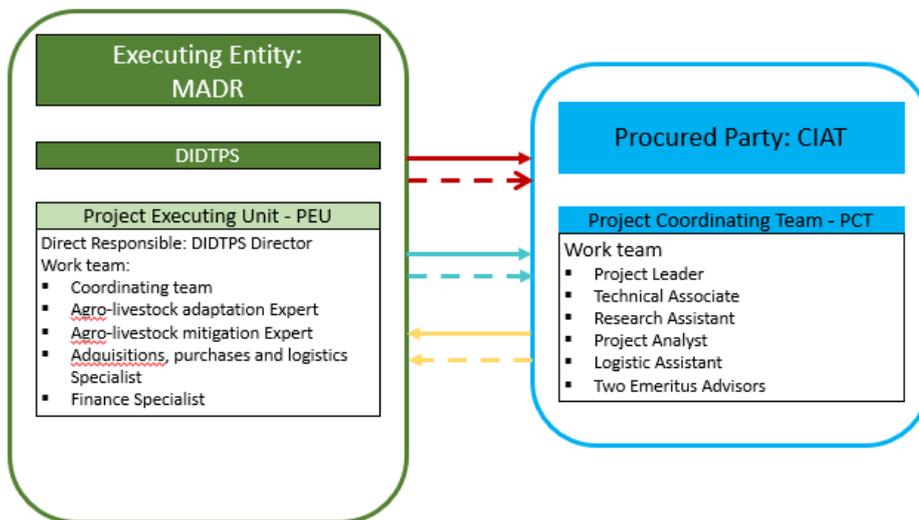


Figure B.4.1. Framework for engagement and interaction between MADR, as EE, and the main procured party

78. The Project Coordinating Team (PCT) will have main theme coordinators and cross-cutting theme leaders. The project will have a group of six theme leaders, comprised of CIAT staff based in the city of Palmira, Valle del Cauca. These are experts with PhDs and renowned experts with at least 10 publications. These leaders will be responsible for implementing the activities of each of the project components. Each will have a budget subject to the project financial plan and procurement plan approved by the executing unit. Each leader is responsible for implementing the activities of each component and ensuring the achievement of their respective outputs and goals.
- Main theme leader 1. Agro-climatic Forecasting and Digital Agriculture Coordinator.
  - Main theme leader 2. Water Efficient Use and Low Emission Technologies Coordinator.
  - Main theme leader 3. Genebank Improvement and Strengthening Technologies Coordinator.
  - Cross-cutting theme leader 1. Knowledge Management and Capacity Building Coordinator.
  - Cross-cutting theme leader 2. Environmental, Social and Gender Affairs Coordinator.

<sup>11</sup> The direct contracting of CIAT will be carried out based on the Colombian national regulations as established in literal (e) numeral 4 of article 2 of Law 1150 of 2007 and by means of which the measures for efficiency and transparency are established in the Law 80 of 1993 and where the general provisions on contracting with public resources are dictated. As well as in accordance with article 2.2.1.2.1.4.7 of Decree 1082 of 2015, articles 2 and 17 of Decree - Law 591 of 1991, article 33 of Law 1286 of 2009.

- Cross-cutting theme leader 3. Impact Assessment Coordinator.

79. The project will also have **eight (8) crop coordinators**, one for each crop. These coordinators are renowned experts in each of the crops, with PhD degrees and with at least 10 publications in the crop to be led, in indexed international journals. These professionals will be responsible for integrating each of the topics within each crop in order to achieve coherence, efficiency and coordination in the implementation processes. These coordinators will be responsible for giving direction and making proposals for improvement, adjustments or coordination activities as needed, which should be covered by the resources managed by the main and cross-cutting theme leaders, as appropriate, given that they will not have a budget allocated for costs other than the cost of their time dedicated to the project. This team will consist of staff from CIAT (livestock, rice, musaceae), CIMMYT (maize), Agrosavia (panela cane and potato), Cenicafe (coffee), and Cenicaña (sugarcane). CIAT and CIMMYT staff will be based in the city of Palmira, Valle del Cauca; Agrosavia in Bogotá at the Tibaitatá headquarters; Cenicafe in Chinchiná (Caldas); and Cenicaña in the municipality of Candelaria, Valle del Cauca. Figure B.4.2 shows the structure of CIAT's work team.

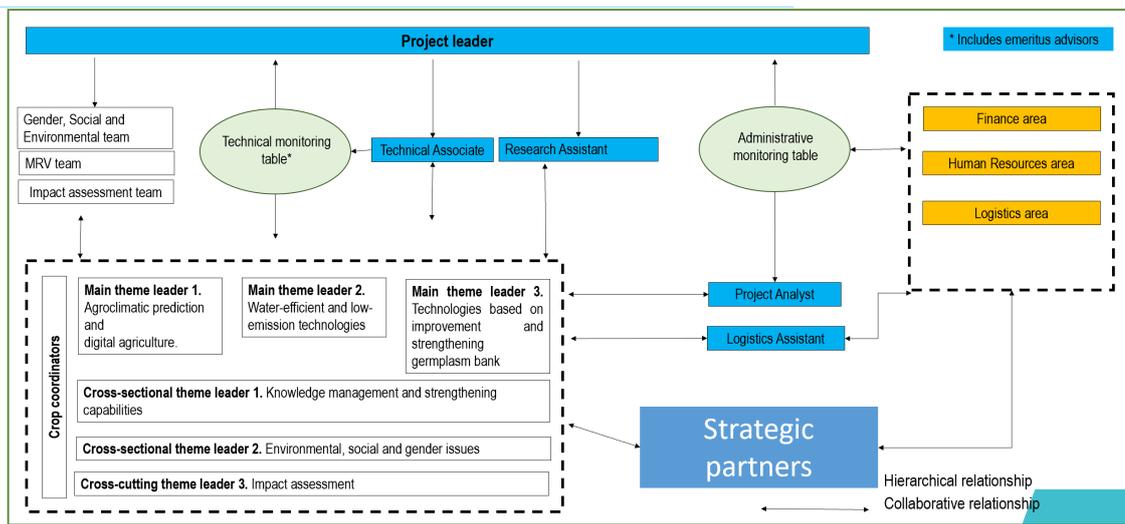


Figure B.4.2. Organigram of the main procured party (CIAT)

80. **Strategic partners.** The project will have thirteen (13) **strategic partners** for project implementation, of which there are ten (10) gremios and three (3) research institutions. For the execution of the CSICAP Project, CIAT will work in coordination with the following 10 gremios: Fedearroz (rice), Fenalce (maize), Fedegan (livestock), Fedepanela (panela cane), Fedepapa (potato), Federación Nacional de Cafeteros - Cenicafe (coffee), Asocaña - Cenicaña (sugarcane), Augura, Asbama, and Aohofrucol (musaceae). Additionally, there are three (3) research institutions as part of the strategic implementing partners: the Colombian Agricultural Research Corporation (Agrosavia), the International Maize and Wheat Improvement Center (CIMMYT) and the Center for Research on Sustainable Agricultural Production Systems (CIPAV) of Colombia (see Figure B.4.3). These strategic partners will have a role in the implementation of project activities and therefore will be assigned a budget that will be subject to outputs and deliverables. The importance of these partners lies in the fact that they are the institutions that will be responsible for the continuity and sustainability of the project actions once the project is completed.
81. These strategic partners are national institutions with presence in the different producing regions of each crop, with a high level of recognition and outreach to producers and a high level of technical knowledge of the production systems prioritized in the project. They are entities with financial capacity that will assume part of the costs of project implementation through the use of public funds assigned to them ("*fondos parafiscales*").

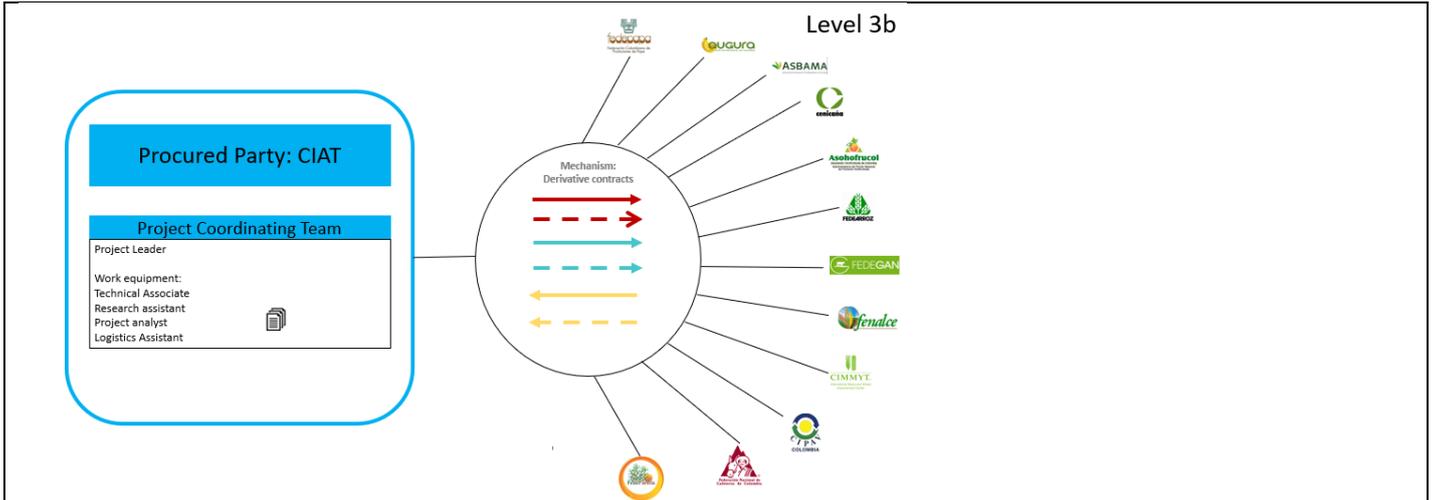


Figure B.4.3. Framework for working with strategic partners

82. **Project supervision structure.** Two bodies will be formed to supervise the project technical and financial execution, the Monitoring Committee and the Steering Committee. The following is the governance structure, its conformation and functions of the different instances.

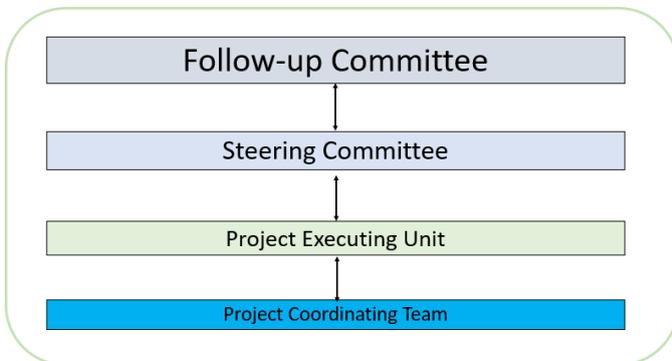


Figure B.4.4. Project governance structure

83. **Monitoring Committee.** The Monitoring Committee will be in charge of approving the progress on technical execution, progress on financial execution, approving compliance with results, making recommendations, observations and/or requesting adjustments. The Committee will have annual meetings. The Committee will be comprised of representatives of MADR (2 delegates: Vice Minister of Agricultural Affairs or his delegate and Director of Innovation, Technological Development and Sanitary Protection), CAF (1 delegate: country representative or his designee), DNP (2 delegates: Director of Sustainable Rural Development and Director of Environment and Sustainable Development), and MINHACIENDA (one delegate). Invited actors include MADS (Director of Climate Change), IDEAM (Director) and others upon approval of the monitoring committee.

84. **Steering Committee.** Its functions are to review the annual operating plan, provide strategic guidance to the project, make recommendations on actions and initiatives to achieve synergies with other projects, programs and policies, identify and recommend strategic partnerships to assist in scaling up project actions, review progress reports on technical execution, financial execution, and compliance with results to be presented to the monitoring committee. The Committee will meet every six months. The Steering Committee will be made up of representatives of MADR (2 delegates: Director of Innovation, Technological Development and Health Protection or his delegate and the project coordinator), DNP (2 delegates: the delegate of the Sustainable Rural Development Direction Office and the delegate of the Environment and Sustainable Development Direction Office or his delegate) and the Alliance of Bioversity International and CIAT (1 delegate: project leader).

**B.5. Justification for GCF funding request (max. 1000 words, approximately 2 pages)**

85. **GCF Fund Justification.** Given the high uncertainty and vulnerability to unexpected weather events, agricultural investments are risky. The GCF investment will help increase the adaptive capacity of farmers and ranchers and support the adoption of new agricultural technologies and practices to make them more resilient to climate change, while supporting GHG emissions reductions. Colombia has suffered the consequences of climatic events that have affected important agricultural regions of Colombia, causing significant monetary losses. Given that Colombia plans to improve a large part of the agricultural infrastructure, productivity and competitiveness, it is necessary to improve the design and technical approach of agriculture and livestock, so that new or rehabilitated fields / crops last longer; and for farmers and ranchers to avoid and prepare for climatic events. However, the nature of the investments required are of a public nature, for which domestic markets and the private sector do not play an important role. On the other hand, the capital markets in Colombia are not ready yet to assume the risks of new technologies or developments in new places. This is why the GCF plays a critical role in reducing risk to manageable levels and, furthermore, in making the technologies developed by the project more widespread as they are adopted on a larger scale.
86. Although the pilot experiences show very high returns on investments in CSICAP technologies (see Annex 23 for the ex-post evaluation of the pilots), there is a large gap in Colombia for these technological options to be adopted at scale, and become the norm. Although the farmer groups see the advantages in these investments, they do not have the financial capacity to generate the technologies required to improve resilience and reduce the carbon footprint, so they need support from the public sector to make these public goods investments. Most of the reasons are related to the associated risks and the lack of institutional capacity to mobilize farmers for the adoption of technologies and practices, both areas where the participation of the GCF can help to change the current paradigm. The project, through its activities, seeks to reduce these associated risks in terms of the adoption of climate-resilient and low-carbon technologies and practices.
87. It is important to note that and in the economic recovery strategy of the Government of Colombia post-COVID 19, investments are being promoted to be resilient and low in carbon, a bet that the Government is making after the signing of the peace accords in 2016.
88. **Justification of financial instruments.** The proposed financial instruments (loans and grants) were selected for each of the components and activities according to the nature of the investments (whether they are public or private goods), and the financing and co-financing capacity, both of the public sector and from the private sector (e.g., agricultural producer organizations). In this case, there is a balance between loans and grants for each of the components, both GCF funds and CAF loan resources. The Government of Colombia, through the decision to take senior loans for these investments in these public goods (USD 25 million from the GCF and USD 10.3 million from the CAF), shows the level of commitment it has with this Project. Furthermore, the mix of loans and grants is justified in the sensitivity analysis included in the Economic and Financial Analysis (Annex 3).
89. **Justification of the level of concessionality.** GCF offers a unique opportunity for blending low interest loans and grants, reducing the financial cost of the project, and representing a specialized source of climate financing. The project is structured in such a way that there is a minimum of concessionality to make the investments in the proposed activities possible with the participation of the private sector and the public sector. As shown in the Economic and Financial analysis (Annex 3), the reduction in the concessionality would make the project not viable. When reducing the grant amount by only a third, would make the project non-viable for certain gremios (i.e. livestock and sugar cane). At reduced levels of grants (75% reduction) the project is not viable for the majority of the gremios. There are no commercial financing sources available in Colombia for the type of investments (gene banks and seed improvement, big data, GHG emission measurement, etc.) considered by the project. That is, reimbursable instruments to the producers (instead of grants) are not viable because these kinds of investments are usually not financed to farmers. Also, around 10 percent of total project costs go to public infrastructure that do not have direct revenue generation potential. Without GCF and CAF support, the government would need to look for another unlikely available similar sources of funding. The concessionality in this case mainly benefits the producer associations, which in turn are willing to provide co-financing so that the project's objectives are met. About a third of the project are loans that the Government of Colombia is taking from the GCF (USD 25 million) and CAF (USD 10.3 million), as these are mainly investments in public goods. There is a total of USD 16.5 million of direct co-financing from the farmer groups and CIAT, which represents about 17 percent of the total amount of the project. The rest, approximately 48,3 percent of the total project budget is grants. In this case, the grants will benefit direct activities with direct beneficiaries in the different production chains. The level of concessionality of the GCF instruments is the minimum required to make the investments viable, with the proposed structure adjusted to the minimum concessionality required for the project to be viable. Please refer to the detailed sensitivity analysis in Annex 3 for different levels of concessionality and project viability.

**B.6. Exit strategy and sustainability (max. 500 words, approximately 1 page)**

90. CAF has a long history of supporting the Government of Colombia and the agricultural sector for the implementation of innovative ideas. In this case, the proposed project has been designed in close consultation with the MADR, at the national, regional and local levels, as well as with the participation of the farmer groups. These consultations and discussions (detailed in Annex 7), combined with the experience of the pilot project and the technologies tested in them that are detailed in the Feasibility Study (Annex 2) and evaluated ex-post (Annex 23), provide the project with a solid approach and a set of interventions that they are implemented with strong participation from farmers' groups and commitment from local officials. On this basis, the project ensures that investments, as well as the results of interventions, are sustained beyond the project period and in the long term through the following elements of project design and implementation.
91. A key innovative feature of the project is the strengthening of the capacities of the gremios, through inclusive and participatory approaches. The active participation of these groups in each of the productive chains in the project (Components 1 and 2, and Result 3.1), and the strengthening of agricultural extension systems (Results 1.1 and 3.2), including the active participation of Agrosavia, they represent changes towards the long-term sustainability and replicability of the adaptation and mitigation measures introduced for each production chain. In the case of public goods developed by the project (especially in Result 2.1), these will be incorporated into Agrosavia's extension systems, as well as each of the farmer associations within the project. By internalizing these investments, Agrosavia will be able to apply those tools and knowledge to other crops beyond the project term. Moreover, the purposively engagement of key stakeholders beyond the agricultural sector such as the financial institutions will enable achieving benefits by a wider number of beneficiaries beyond the project's timeline as a mechanism to keep de-risking the agricultural sector as tailored-made financial mechanisms are developed and scaled by using project's information.
92. The longer-term sustainability of the project's investments will be guaranteed through a combination of elements and mechanisms that promote the ownership and technical, financial, operational and institutional capacities of the national government through the MADR and Agrosavia and the farmer groups to maintain and obtain social, economic, and environmental benefits from the proposed investments. In this case, the joint investments of the farmer groups will be used for the activities proposed in the installation and operation and maintenance (O&M) of the proposed solutions (an O&M Plan is described in Annex 25). In this way, the project will promote the appropriation of the processes that are established and/or strengthened, and will catalyze greater financing from the private sector through the farmer associations, to maintain and sustain the products and results beyond the project execution period.
93. The gremios have been an active participant of the project formulation (as described in the Annex 7 of project consultations). They have participated in the design of the activities, the resources required to implemented them, the time required and the definition of the role of the different stakeholders. In that sense, the gremios know the implied investment costs, the O&M of each activity during and after project completion. The current commitment of the gremios for project implementation is financial (through cofinancing), and after project completion, they will take control and operation of all the tools, technologies and processes developed under the project. In fact, project design foresees that the gremios will take gradual control of all the activities for a smooth transition once the project is completed. This transition will be supported by the instructional strengthening, through local consultants covered by the project, which will support the gremios and other local institutions after the project is completed. The knowledge and capacity of this locally trained personnel will strengthen the institutions capacity, ensuring the sustainability of the project outcomes beyond project completion. Gremios will be responsible of the implementation of project activities, and they will implement financial resources (loan and grant) from GCF and CAF, under which they will sign agreements with their own financial resources (cofinancing).
94. At the end of the project, the equipment and infrastructure developed by the project will continue to be in the name of MADR, but once the project is completed, they will be delivered to the gremios through a contract of bailment (*contrato de comodato*) in which the gremios manage the assets and services (including data platforms) but undertake to give it proper use and assume maintenance costs and responsibility (in compliance with national regulations. This mechanism has been used in several projects between MADR and the gremios, including the pilot project. A large part of the success of the pilot project lays in the strengthening of capacities and empowerment of the gremios (Fedearroz and Fenalce), which continued and expanded the work carried out with them.

C. FINANCING INFORMATION						
C.1. Total financing						
(a) Requested GCF funding (i + ii + iii + iv + v + vi + vii)		Total amount			Currency	
		73.28			million USD (\$)	
GCF financial instrument		Amount	Tenor	Grace period	Pricing	
(i)	Senior loans	25.00	<u>20</u> years	<u>5</u> years	<u>0.75</u> %	
(ii)	Subordinated loans	Enter amount	Enter years	Enter years	Enter %	
(iii)	Equity	Enter amount	Enter years		Enter % equity return	
(iv)	Guarantees	Enter amount				
(v)	Reimbursable grants	Enter amount				
(vi)	Grants	48.28				
(vii)	Results-based payments	Enter amount				
(b) Co-financing information		Total amount			Currency	
		26.63			million USD (\$)	
Name of institution		Financial instrument	Amount	Currency	Tenor & grace	Pricing
CAF		Senior Loans	10.30	million USD (\$)	<u>20</u> years <u>60</u> months grace period	( <u>Libor + 1.8</u> )%
CIAT		<u>Grant</u>	4.85	million USD (\$)		
AGROSAVIA		<u>Grant</u>	2.90	million USD (\$)		
CIPAV		<u>Grant</u>	0.23	million USD (\$)		
CIMMYT		<u>Grant</u>	0.80	million USD (\$)		
FEDEARROZ		<u>Grant</u>	1.99	million USD (\$)		
FENALCE		<u>Grant</u>	1.07	million USD (\$)		
FEDEPAPA		<u>Grant</u>	1.10	million USD (\$)		
FEDEPANELA		<u>Grant</u>	0.45	million USD (\$)		
FEDEGAN		<u>Grant</u>	0.28	million USD (\$)		
ASBAMA/ AUGURA ASOHOFRUCOL		<u>Grant</u>	1.49	million USD (\$)		
ASOCAÑA		<u>Grant</u>	1.16	million USD (\$)		
(c) Total financing (c) = (a)+(b)		Amount			Currency	
		99.91			million USD (\$)	
(d) Other financing arrangements and contributions (max. 250 words, approximately 0.5 page)		Please explain if any of the financing parties including the AE would benefit from any type of guarantee (e.g. sovereign guarantee, MIGA guarantee).				
		Please also explain other contributions such as in-kind contributions including tax exemptions and contributions of assets.				
		Please also include parallel financing associated with this project or programme.				

95. Part of the co-financing of the farmer groups, will be in-kind contributions. The farmer associations are expected to make investments in equipment, hire new technicians for the implementation of the program, among other investments. In the same way, existing personnel, supplies and other in-kind contributions would also be part of their cofinancing.
96. As an international organization established in Colombia, CIAT has a special tax-exempt status in that country.

## C.2. Financing by component

97. The project is financed with a mix of financing resources from CAF (Development Bank of Latin America), the Government of Colombia, agricultural research institutions (Alianza Bioversity CIAT, CYMMIT and CIPAV), and the associations of agricultural producers in Colombia, and resources, both loan and concessional funds (grants) from the GCF. The financing plan of the Project broken down by source of resources (loan, grant from the GCF and local counterpart) is presented in the following table. The total project amount is USD 99.91 million, of which USD 73.28 million are GCF funds (USD 25 million in senior loan and USD 48.28 million in grant). CAF contributes to the Project with a senior loan of USD 10.3 million. The co-financing of the institutions and entities involved in the Project such as the Alliance between Bioversity International and CIAT and the farmer groups is USD 16.3 million.
98. The Government of Colombia has provided space in its budget for funds for the implementation of the project, through the Ministry of Agriculture and Rural Development (MADR). The Government of Colombia is taking loan resources with the GCF for USD 25 million for a 20-year term with a 5-year grace period, at a rate of 0.75% and with the CAF for a total of USD 10.3 million, a 20-year loan, with a 60-month grace period, at an interest rate of LIBOR + 1.8%. The following table shows the detail by component and product of the GCF financing amounts (loans and grants), as well as the co-financing of the project. Annex 14 provides details of the loan disbursement and payment schedule.
99. The summary of the project costs for each of the Components and Products, by type of source (GCF or cofinancing) and instrument (loan or grant) are presented in the following Table. The detail of the budget is presented in Annex 4 and its execution schedule is presented in Annex 5. In Annex 4, the budget provides the breakdown by type of expenses. As the CSICAP project will be implemented in 22 departments and 219 municipalities, it requires the deployment of local consultants and staff to support the implementation of the project activities. Thus, almost 37 percent of the total budget will go into local consultants that include personnel in the field (extension services and technicians) that will work on the field to provide technical capacity building to local farmers to implement the technologies (on average, 1.7 people in the field to cover each municipality and support 573 farms). Local staff (such as scientific advisors and scientists), which represent 19 percent of the budget, will develop the local varieties and their time dedicated to the project will be tied up to specific products and deliverables that will contribute to the results and outcomes of the project. International consultants represent 2 percent of the budget. Local consultants represent more than 90 percent of total personnel, with staff representing 3 percent and international consultants represent 6 percent; Construction (10%) and equipment (7%) represent 17 percent; services (e.g., field preparation, equipment installation, lab analysis, publications, etc.) represent 15 percent of total budget. Finally, training (3%) and travel (7%), this last which is almost entirely local travel for the field work of local consultants and staff, represent about 10 percent of total costs.

Component	Result	Indicative cost million USD (\$)	GCF financing		Co-financing		
			Amount million USD (\$)	Financial Instrument	Amount million USD (\$)	Financial Instrument	Name of Institutions
1. Digital agriculture and climate services for rural modernization with an emphasis on adaptation and mitigation	1.1. Strengthening and modernizing the agricultural extension system with an emphasis on adaptation and mitigation	23.190	9.135	Grants	5.230	Grants	GOC, AB-CIAT, Gremios, CYMMIT y CIPAV
			6.250	Senior Loan	2.575	Senior Loan	CAF

	1.2 Agroclimatic services in place and/ or strengthened	16.425	4.410	Grants	3.190	Grants	GOC, AB- CIAT, Gremios, CYMMIT y CIPAV	
			6.250	Senior Loan	2.575	Senior Loan	CAF	
2. Genetic improvement, crop management techniques and other technological options and their scaling-up to increase climate resilience and promote low- carbon agricultural development	2.1. Strengthenin g the germplasm bank, new climate resilient varieties developed and their seeds massively distributed	23.178	10.345	Grants	4.008	Grants	GOC, AB- CIAT, Gremios, CYMMIT y CIPAV	
			6.250	Senior Loan	2.575	Senior Loan	CAF	
	2.2. More efficient use of water resources, restoring soil properties, and improving GHG mitigation practices by farmers and gremios through the adoption of new climate smart practices and technologies	24.848	14.517	Grants	2.494	Grants	GOC, AB- CIAT, Gremios, CYMMIT y CIPAV	
			6.250	Senior Loan	1.586	Senior Loan	CAF	
	3. Innovative and inclusive business models through modernized innovation systems and a more engaged financial sector	3.1. Improved business models that provide farmers with reasonable profits and improved GHG mitigation practices	3.152	2.279	Grants	0.872	Grants	GOC, AB- CIAT, Gremios, CYMMIT y CIPAV
				0.00	Senior Loan	0.00	Senior Loan	CAF
3.2. Modernized technical assistance and agricultural extension services with multi-tool strategies,		5.420	4.890	Grants	0.530	Grants	GOC, AB- CIAT, Gremios, CYMMIT y CIPAV	
			0.00	Senior Loan	0.000	Senior Loan	CAF	

	differentiated and adapted to specific environmental, social, gender and productive contexts at the national level						
Project Management Cost		3.693	2.704	Grants	0.00	Grants	GOC, AB-CIAT, Gremios, CYMMIT y CIPAV
			0.00	Senior Loan	0.988	Senior Loan	CAF
<b>Indicative total cost (USD)</b>		99.910	73.283 25.000 Senior Loans 48.283 Grants		26.627 10.300 Senior Loans 16.327 Grants		

**C.3 Capacity building and technology development/transfer (max. 250 words, approximately 0.5 page)**

C.3.1 Does GCF funding finance capacity building activities? Yes  No

C.3.2. Does GCF funding finance technology development/transfer? Yes  No

100. One of the pillars of the project and areas of major focus of the CSICAP project is financing the development and transfer of technology. Under Component 1, Product 1.2 of "*Information services to reduce agroclimatic risk*" guaranteeing technical support in the implementation of adaptation and mitigation measures to about 123,000 of these producers. Under Component 2, the generation (Result 2.1) and the transfer of technologies and sustainable management practices in agriculture and livestock (Result 2.2) will be financed, which will be formulated and implemented on a large scale; at least 30 new technologies will be developed, validated and implemented and 70 existing ones will be scaled up. The total amount of GCF funds for technology development and transfer is 64.02 million, of which USD 25.17 million correspond to Component 1 and USD 33.08 million to Component 2.

101. With regard to training, the project under Component 1, Result 1.1 "Strengthening and modernization of the agricultural extension system aimed at adaptation and mitigation", training and training 2,200 technicians in the management of extension tools to modernize and expand the coverage of agricultural extension in Colombia. Under Component 3 of "Innovative and inclusive business models", the project expects to strengthen capacities in at least 60 entities of the agricultural sector (considering Departmental and Municipal Agriculture Secretaries), 4,400 technicians and reinforcement of training for 54,000 agricultural producers. The training activities under Component 3, for USD 5.76 million.

## D. EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA

This section refers to the performance of the project/programme against the investment criteria as set out in the GCF's [Initial Investment Framework](#).

### D.1. Impact potential (max. 500 words, approximately 1 page)

102. It is estimated that the Project will have positive impacts on more than 619,691 direct beneficiaries (producers and their families),<sup>12</sup> along the different gremios of cattle ranchers and producers of rice, cereals and legumes, potatoes, coffee, sugar cane and panela cane, bananas and plantains. The direct beneficiaries include producers, professionals from the farmer associations, and professionals from other entities of the agricultural sector. The production area associated with these direct beneficiaries and that the project would cover is estimated at 967,997 hectares. The number of indirect beneficiaries is estimated at about 347,996 during the project execution period,<sup>13</sup> and more than 500,000 during the useful life of the technologies.<sup>14</sup> It is important to note that based on the figures from the National Agricultural Census of Colombia,<sup>15</sup> the direct beneficiaries are equivalent to 7.2 percent of the total producers at the national level, while the total indirect beneficiaries would be equivalent to 4.1 percent of total producers. Additionally, a total of 10,000 households are estimated to benefit from increased food security.<sup>16</sup> As previously mentioned, at the geographical level, the project will cover 22 departments (69% of the total departments in Colombia) and 219 municipalities (20% of the total municipalities in Colombia). Table D.1.1 summarizes the different beneficiaries (producers, professionals from the farmer associations, and professionals from other entities, independent and students who will benefit from the Project) under each of the three components.

Table D.1.1. Number of direct beneficiaries by crop and total area (hectares) covered by the project

Agricultural activity	Component 1. Modernization of agriculture for adaptation	Component 2. New technological options to increase resilience and low carbon	Component 3. Innovative and inclusive business models	Total beneficiaries <sup>(a)</sup> and hectares
Beneficiaries	392,378	56,149	171,164 <sup>(b)</sup>	619,691
Rice	9,114	5,396	11,101	25,612
Potato	41,623	11,861	46,110	99,594
Sugar cane	1,137	5,247	2,544	8,928
Panela cane	22,260	17,150	38,160	77,570
Dairy farming	25,997	1,526	25,997	53,519
Livestock	25,997	1,526	25,997	53,519
Corn	11,384	12,625	19,080	43,089
Banana	467	817	2,175	3,459
Coffee	254,400	0	0	254,400
Area (hectares)	836,287	131,710		967,997

(a) The total number of beneficiary producers is the sum of Component 1 and 2; a part of these producers is subject to reinforcement in training in Component 3.

(b) Producers who will be beneficiaries through the strengthening of capacities that were previously attended in component 1 and component 2, for which they have already been considered in the total of beneficiaries, so as not to generate double counting.

103. Regarding the mitigation potential, the total emissions that the Project would reduce or avoid throughout its life (25 years) will be 34,878,951 tCO<sub>2e</sub>, or 1,395,158 per year (Table D.1.2). Most of this emission reduction corresponds to livestock (48%), panela cane (18%) and bananas (12%). This reduction in emissions is the result of direct interventions in 8,750 hectares (rice (1,500 ha), corn (900 ha), panela cane (660 ha), potato (600 ha), livestock (3,840 ha) and banana (1,250 ha)) and reduction of emissions in areas (245,368 ha) resulting from farmers that only receive trainings and technical assistance as part of the project intervention. On the other hand, it is expected that the reduction of additional indirect emissions that would be influenced by the project through work

<sup>12</sup> The direct beneficiaries were estimated based on the agreements made by the farmer associations and the implementing entities, taking into account the resources available for the different activities, as well as expected adoption curves of the technologies based on consultations with the farmer associations and experts, taking the more conservative figures. The details of the adoption curves for each crop are presented in the economic analysis (Annex 3). The total number of producers (194,871) were then multiplied by the average rural household size of 3.18 people to obtain the total number of direct beneficiaries. Annex 24 provides further details on these calculations.

<sup>13</sup> Indirect beneficiaries during the project period were based on the adoption curves of the different components, which were constructed with parameters of experts participating in the project and/or secondary literature, and the percentage of producers who would use the technologies was estimated until the last year of the project. This estimate does not include direct beneficiaries. See Annex 24 for further details.

<sup>14</sup> The total indirect beneficiaries were estimated based on the adoption curves of the different technologies until their obsolescence, which in many cases goes beyond the life of the project. This percentage excludes direct and indirect beneficiaries under the project.

<sup>15</sup> According to the 2014 National Agricultural Census, in Colombia there are 2.7 million producers in the field, and of them 725,000 are resident producers, which is equivalent to 26.7% of the total. Of those, 461,000 are men and 264,000 are women.

<sup>16</sup> It is estimated that around 10% of agricultural households (out of a total of 100,000) would benefit from the project.

with each of the farmer associations through agricultural extension services would be 34.9 million tCO<sub>2e</sub>, associated with a total of 981,471 hectares managed in a sustainable way, mostly from pasture management in livestock, from where 83 percent of the reduction of emissions would come.

Table D.1.2. Reduction of direct and indirect greenhouse gas emissions estimated per crop (tCO<sub>2e</sub>) and associated area (hectares)

Agricultural activity	Direct emissions reductions (tCO <sub>2e</sub> )	Area (hectares)	Indirect emissions reductions (tCO <sub>2e</sub> )	Area (hectares)
Rice	417,323	38,861	1,505,226	148,724
Corn	86,495	17,574	282,121	66,696
Panela cane	708,425	16,671	2,518,508	64,045
Potato	116,500	6,677	328,706	24,310
Livestock	7,727,180	170,640	30,075,841	667,200
Banana	96,111	3,874	168,549	10,496
<b>Total</b>	<b>9,152,034</b>	<b>254,118</b>	<b>34,878,951</b>	<b>981,471</b>
<b>Annual average</b>	<b>366,081</b>		<b>1,395,158</b>	

Source: Own elaboration based on calculations in Annex 22.

## D.2. Paradigm shift potential (max. 500 words, approximately 1 page)

104. The project seeks to change the current trajectory of agricultural practices and technologies, which, for example, have limited investment in innovative proposals such as the use of digital media to disseminate climate information, the use of agroclimatic services to offer accurate and timely information to farmers. Farmers, as well as limitations on investments to develop varieties that are resilient to the climate or with low production of GHG emissions and modernize the agricultural extension system so that it offers information to farmers so that they can adapt their practices and technologies towards more investments. Resilient and low carbon. In that sense, the project is transformative as it is systematically integrating climate into decision-making processes from the national level to the farm level. This project will invest in the implementation of adaptation measures of the agricultural sector in prioritized crops and locations in Colombia that will be further expanded throughout the country, as the different sectors begin to replicate the project experience.

105. **Potential for scaling up and replication.** MADR and CIAT have already implemented a pilot project that includes rice and cotton in some regions of Colombia such as Villavicencio, Yopal, Aguazul, Ibagué, Saldaña, Neiva, Aipe, Montería, Espinal, Ciénaga de Oro, Buga, Espinal and Cereté. The project will allow the scaling up and replication to other crop regions and cover more products through the mechanisms of agricultural extension and inter-institutional collaboration that the project will strengthen and / or establish between the private sector farmer associations involved (Product 1.1), Agrosavia, and CGIAR institutions. and the experiences and lessons learned from the project. Specifically, the project would currently cover a total of 22 departments (69% of the country's departments) and 219 municipalities (20% of the Colombian municipalities). It is expected that once the project is completed, and based on the previous experience of the pilots prior to 2020, the farmer associations, with the support of MADR, Agrosavia and CIAT, will continue to expand the adoption of the technologies to other crops and municipalities, reducing the risks for the adoption of these technologies, reducing their costs with increased scaling-up and replication of those technologies. For example, due to the level of investment that will be made in climate information systems, there will be a greater opportunity for producers of other crops within the same regions to access this information. On the other hand, the extension program will allow the collection of lessons learned that can be replicated among peers in other regions of the country and for other crops to facilitate the adoption of technologies and best practices.

106. **Potential for knowledge sharing and learning.** The project will generate the necessary knowledge to build new agricultural technological capabilities, empowering producers to launch similar projects on their own. Specifically, Result 3.1 will be in charge of allowing the dissemination, access and use of the project results by the key public and private actors to strengthen the capacities that allow influencing future improvements in public policy. Management meetings are planned together with national institutions, development of communications with the farmer associations to keep them updated on the progress of the project, presence in social networks and the development of communication and knowledge products. CIAT is a good vehicle for knowledge management given its solid track record and research capacity, worldwide presence and strategic alliances with the productive sector. Specifically, the Technical Assistance and Learning Service that will be financed by the Project will be used to disseminate successful experiences and show how to participate and take better advantage of this financial opportunity. On the other hand, Product 3.2 of the monitoring and evaluation of the project will allow a rigorous follow-up and evaluation of the interventions and measure the impact of these on the production and well-being of

the farmers, which will allow a better understanding of the success mechanisms for the adoption and use of practices and technologies.

107. **Contribution to the creation of an enabling environment.** This Project is the main initiative of the MADR to implement a resilient and low-carbon agriculture as the standard at the sector level of management practices and agricultural technologies and to create an enabling environment for the application and expansion of technologies at the national level. This will be done through the farmer's organizations participating in the different production chains and Agrosavia as a strategic partner of the project. As the national (MADR, Agrosavia, etc.) or local governments promote the practices and technologies developed and/or improved by the project, the reduction of technical, institutional and financial barriers will be facilitated, as well as the perception of the risk of investment in such technologies, creating the right environment to expand the application of such technologies. The successful development of projects and the evidence of technical, technological and scientific advances under Components 1 and 2, and disseminated under Result 3.2, will lead to a massive adoption of CSICAP, reducing the perceived investment risk and lowering the costs of technologies, learning from experiences and adapting them to real needs and conditions. The project will engage with the different stakeholders along the value chain (producers, gremios, buyers and other actors such as financial institutions, industry, trade associations and service providers) in the co-design, generation and validation of replicable and successful business models and an escalation strategy that allows the results of the project to be later escalated. The project will leverage additional funds at the national level to invest in technology packages, based on the evidence generated by the project. The lessons learned from the project have the potential to leverage additional funds internal to the country through the creation of practical evidence. The strengthening of agroclimatic information will generate an enabling environment for the use and application of climate information to be integrated into the productive chains of the different producer associations.
108. **Contribution to the regulatory framework and policies.** As described in more detail in section D.5, the project contributes to the implementation of the Comprehensive Plan for Climate Change Management of the Agricultural sector (PIGCCS-Agropecuario) of the MADR, which identifies, evaluates and guides the incorporation of measures for adaptation to climate change and mitigation of greenhouse gases in the policies and regulations of the agricultural sector and is in turn aligned with the strategic line of "rural development resilient to the climate and low in carbon" of the PNCC. Similarly, the project contributes to the Comprehensive Plan for Territorial Climate Change Management (PIGCCT), which provides guidelines for the implementation of sectoral adaptation and mitigation measures at the territorial level.
109. **Overall contribution to climate-resilient development pathways consistent with relevant national climate change adaptation strategies and plans.** The project supports the achievement of the goals under the National Development Plan 2018-2022, in particular those of the "[Pact for Sustainability: produce while conserving and conserve by producing](#)" and the environmental goals of the Regional Pacts; It also contributes to the strategies of the National Climate Change Policy, with the achievement of the objectives, strategies and lines of action of the Green Growth Policy and with the achievement of the goals of the National Determined Contribution (NDC). More details are presented in section D.5.

### D.3. Sustainable development (max. 500 words, approximately 1 page)

110. **Economic co-benefits.** Through the establishment of improved agricultural technology, incomes are expected to increase, especially at the local level, with positive impacts for economic development and poverty reduction. Food security will be improved while government investments will be reduced. In addition, the losses avoided will mean lower costs to the government and lower insurance premium payments. As productivity increases, farmers will have higher incomes, improving livelihoods. The Project can help increase the value of farmers' activities and products through value chains. With capacity development, better-trained farmers will create greater job opportunities for them. Increasing returns to labor, returns to capital inputs, and returns to environmental inputs will increase sustainability. The economic analysis of the project (Annex 3) shows the quantification of the economic

benefits of the project for both producers and consumers as a result of the adoption of technologies that increase the productivity and reduce production costs, as well as the economic benefits from reduced CO<sub>2</sub> emissions.

111. On the other hand, in the cost-benefit analysis of the project (see section D.6), additional expected results that were not considered in the analysis include:
- Economic value of GHG emission reductions derived from the adoption of technologies proposed by CSICAP, promoting sustainable and green development, and reducing the need to expand the agricultural frontier due to increased productivity.
  - Increase in the diversity of new crops and development of improved crops promoting food security, within Colombia and worldwide.
  - Improvement in the planning of the agricultural sector to avoid that the impacts of climatic events affect the final price structure and, at the same time, create climate-resilient value chains.
  - Greater efficiency in public-private action, by strengthening alliances for the creation of public goods.
  - Support to three of the priority regions of the NDC for adaptation measures (Caribbean, Andean and Orinoquia regions) and to the strategic lines of work outlined by Colombian adaptation policies.
112. **Social Co-benefits.** The project will positively influence the food security situation by increasing the availability of food, improving access and its quality. In the event of natural disasters, the affected regions will be less vulnerable and can guarantee food supplies. As the population becomes less vulnerable to climate change and extreme weather events, health and safety will increase. Social inclusion will be sought, with emphasis on strengthening the role of women in the adoption of new cultural approaches, and greater youth participation will be sought. Cultural practices will be combined with new technologies.
113. **Environmental Co-benefits.** In addition to the environmental problems associated with the expansion of the agricultural frontier, other problems such as the use of chemical products, deforestation, fires, conventional tillage, the use of heavy machinery and intensive irrigation have caused that 40% of the territory present some degree of erosion. Thus, 2.9% of the country's surface is in a severe and very severe degree of erosion, and moderate erosion extends over 16.8% of the territory, while slight erosion is observed in 20% (DNP, 2015b). CFCA is essential for the implementation of measures that reduce the vulnerability of production systems to weather-related events, since their production systems are characterized by "being diversified, using a greater number of varieties (including native or autochthonous), making less use of chemical inputs and apply soil and water conservation practices" (MADR and ADR, 2017). In addition, "the adoption of sustainable technologies contributes to increasing its productivity, while reducing production costs, with which sustainability and competitiveness go hand in hand" (MADR and ADR, 2017).
114. **Gender sensitive development impact.** In Colombia, 5.3 million women inhabit the Colombian countryside and play a central role in agricultural production, food security and resilience in communities to climate change ([IDEAM, PNUD, MADS, DNP, CANCELLERÍA, 2017](#)). 27.8% of rural households are headed by women, and 36.6% of the country's agricultural production is in the hands of women. In addition, they lead a large part of community life, weave social relations and build reconciliation and peace in their territories (FAO et al., 2018). However, structural gaps still persist that, if not addressed, could be a barrier to the implementation of adaptation and mitigation measures in the sector. The project, through its Gender Action Plan, seeks to reduce the barriers faced by women producers who participate in the Project and will take advantage to identify opportunities, in an articulated manner between different actors, to favor a greater participation of rural women in local development.

#### D.4. Needs of recipient (max. 500 words, approximately 1 page)

115. **Vulnerability of Colombia and the beneficiary groups.** Poverty levels are higher in rural areas of the country. In 2017, the multidimensional poverty index in the populated and dispersed rural centers was 3.2 times higher than that of the municipal capitals (36.6% vs. 11.4%). The proportion of the population below the poverty line is also higher in dispersed rural areas (36%) than in the capital cities (24.2%) ([DANE, 2018](#), p. 45), all of which reveals the persistence of important gaps between the country and the city. Many of these departments are characterized by high levels of rural poverty and small farmer systems.
116. **Level of economic and social development.** A challenge for the agricultural sector in social matters is productive inclusion, since the average level of income per worker of the dispersed population is barely a third of the legal minimum wage. Also noteworthy is the high-income inequality between residents of populated centers and those in dispersed rural areas, evidenced by a Gini coefficient of 0.456 ([DNP, 2015](#)). Within the agricultural sector, the role played by peasant, family and community agriculture (CFCA) stands out as it is responsible for 70% of the food that is destined for local markets in Colombia. The Third National Agricultural Census shows that 75% of the production units are in the hands of peasants, employing 57% of the sector's workforce (FAO et al., 2018). Compared to other agricultural schemes, the CFCA is characterized by allocating a greater amount of its production for self-consumption, as well as by its greater participation in community associations, greater use of traditional and

uncertified seeds, less access to machinery and less use of systems. irrigation and chemical synthetical fertilizers (MADR and ADR, 2017).

117. **Absence of alternative sources of financing.** As mentioned in section B.5, the nature of the initial investments that are required are of a public nature, so that domestic markets and the private sector in Colombia do not play an important role in that stage. On the other hand, despite the fact that the farmer associations see the advantages in investments, they do not have the financial capacity to generate the required technologies. That is why interventions are required to reduce the risk of investment in these technologies and in this case, it is the Government of Colombia that is borrowing to achieve this change. In this case, the Government of Colombia seeks a minimum level of concessionality, in the absence of alternative sources of financing that allow reducing risk to more acceptable levels that catalyze investments by the private sector.
118. **Need for strengthening institutions and implementation capacity.** There is a need to strengthen institutions at the national and local level (Agrosavia, farmer associations, etc.) for scaling up practices and technologies that are resilient to climate change and low in carbon, while at the same time strengthening the implementation capacity of these institutions in those technologies. In this case, and as seen in the barrier analysis (section B.2) under the three project components, especially under Result 3.1, the institutional capacities of various actors in the agricultural sector will be strengthened. The focus on instructional strengthening is reflected in the budget, where 37 percent of the budget is dedicated to local consultants and 19 percent to local staff, which will be part of the project during its implementation and will support the gremios and other local institutions after the project is completed. In a sense, these personnel, along with their gremios and institutions, become project beneficiaries, as their knowledge and capacity will strengthen the institutions that they work with, ensuring the sustainability of the project outcomes beyond project completion.

#### D.5. Country ownership (max. 500 words, approximately 1 page)

119. **Alignment with policies and strategies at the national and sectoral level.** The project is included in the **GCF Country Program** and is aligned with the **2018-2022 National Development Plan "Pact for Colombia, Pact for Equity"**, in its goal for Agriculture and Rural Development to increase the area with prioritized agricultural production systems that implement initiatives for adaptation to climate change. Objective 5 of the **Pact for Entrepreneurship and Productivity** aims to encourage investment in the field through the reform of the instruments of the National Agricultural Credit System and the management of market and climate risks, with strategies such as implementation of the Policy for the Comprehensive Management of Agricultural Risks and the Information System for the Management of Agricultural Risks. The project is aligned with the **Pact for Sustainability "producing conserving and conserving producing"** that seeks a balance between the conservation of natural resources and production, and which has proposed actions on the efficient use of water, materials, energy and soil. It also promotes the development of the circular economy, through innovation and the adoption of new technologies, and encouraging the control of deforestation and ecosystems degradation. Strategic interventions are also identified to prevent and reduce disaster risk and achieve adaptation to climate change, for which it proposes productive activities committed to sustainability and mitigation of climate change.
120. Likewise, it is aligned with the various climate change plans and strategies such as the National Determined Contribution (NDC) and its [2020](#) update under the emission reduction goals in the agriculture, forestry and other land use sectors and associated actions under the nationally appropriate mitigation actions (NAMA) for sustainable cattle farming, the Coffee NAMA, the comprehensive strategy of the panela subsector, the reduction of emissions in rice production, and the implementation of innovative adaptation actions in agriculture; the **National Policy on Climate Change (PNCC)** and the strategic line of "low-carbon and climate-resilient rural development"; With the **National Plan for Adaptation to Climate Change (PNACC)**, and the prioritized actions of "agricultural production and food security adapted to climate change", which among others include: i) Identification of crops that will be affected by temperature change and precipitation, as well as by floods, coastal and continental erosion, saline intrusion, drought and other effects of climate change and climate variability; ii) Train and disseminate new cultivation and irrigation technologies to small and large producers with tolerance to changes associated with climate change; iii) Investigate technology and innovation for climate-smart agriculture; iv) Recover productive systems of traditional knowledge that tend to maintain and/or increase resilience in the face of climate change. Similarly, it is aligned with the **Green Growth Policy (2019)**, under the objective of strengthening the mechanisms and instruments to optimize the use of natural resources and energy in production and consumption; and with the **Colombian Strategy for Low Carbon Development (ECDBC)**, which includes as objectives: i) Empower and motivate the sectors to make decisions that reduce their emissions in the future, achieving at the same time their growth goals and generating social benefits. , economic and environmental; ii) Develop mitigation action plans in

each productive sector of the country with an impact on GHG emissions, as well as NAMA and emblematic mitigation projects in each sector.

121. The project is aligned with the instruments that allow the development of policies at the sectoral and territorial level, such as the **Comprehensive Plan for Sectoral Climate Change Management of the Agricultural sector (PIGCCS-Agropecuario)**, and the **Comprehensive Plan for Territorial Climate Change Management (PIGCCT)**, which provide guidelines for the implementation of sectoral adaptation and mitigation measures at the territorial level. The PIGCCS-Agropecuario identifies, evaluates and guides the incorporation of greenhouse gas mitigation measures and adaptation to climate change in the policies and regulations of the sector and is aligned in turn with the strategic line of "rural development resilient to climate and low in carbon" of the PNCC.
122. The project is aligned with the **Mission for the Transformation of the Countryside** that proposed a set of State policies to "promote integral development (economic, social and environmental) in the Colombian countryside, built from the territory and with a view of the rural area more beyond agriculture", including three strategies on productive inclusion and family farming, agricultural competitiveness and environmental sustainability. The Mission mentions that investment in science and technology has not found adequate solutions to the impacts of phenomena that affect rural areas to a greater degree, such as those associated with climate change, and seeks to plan long-term agricultural investments in crops in order to maintain and raise productivity. Similarly, there is alignment with the **Green Growth Mission**, whose purpose was to define the inputs and guidelines to guide the development of the country towards the year 2030 and which was adopted in 2018. Additionally, the strategy "Forests Territories of Life - Comprehensive Strategy Deforestation Control and Forest Management" with the purpose of curbing deforestation and forest degradation.
123. At the sectoral level, the project is aligned with the **Sectoral Action Plan (PAS) for the Mitigation of Greenhouse Gases** (MADR, 2014) and its three strategic lines: implementation and sustainable intensification, innovation and development, and incentives and financial instruments. Likewise, the project is aligned with the **Strategy for the adaptation of the agricultural sector to climatic phenomena**, whose objective is to reduce the vulnerability of agricultural production to climatic threats to minimize their impacts on the competitiveness of the sector and to have sufficient and stable availability of quality food by strengthening climate risk management (DNP and MADR, 2014). The strategy addresses three programmatic axes: i) strengthen the country's capacity to manage agroclimatic information; ii) adapt the productive systems of the agricultural, fishing and forestry sectors to climatic phenomena; and strengthen the institutions of the agricultural, fishing and forestry sector in their actions related to adaptation to climate change.
124. Finally, the project is aligned with the National Agricultural Innovation System (SNIA), the Strategic Plan for Agricultural Science, Technology and Innovation (PECTIA), the National Seed Plan (PNS), the National Policy for Disaster Risk Management and the National Disaster Risk Management System, the National Policy for Sustainable Land Management (PNGSS) (MADS, 2016), the National Policy for the Comprehensive Management of Water Resources (2010-2022), and the Zoning Statute of Adequate Use of the Territory (EZUAT).
125. **Implementation capacity of Executing Entity.** The MADR will select through the direct contracting modality, in accordance with literal e) of numeral 4 of article 2 of Law 1150 of 2007, in accordance with article 2.2.1.2.1.4.7 of Decree 1082 of 2015, articles 2 and 17 of Decree - Law 591 of 1991, article 33 of Law 1286 of 2009, to an institution as the main procured party that will be in charge of the operational, technical and administrative execution of the project. Prior to this process, a detailed profile will be structured that the entity to be selected must comply with, and that will be in accordance with the technical and administrative competencies required by the operational implementation of the MADR. The MADR foresees the signing of a technical and scientific cooperation agreement with the entity that will act as the main procured party to formalize the relationship and regulate the administration processes, execution mechanisms and transfer of resources between both institutions. Once the selection process has been completed, the entity that assumes as the main procured party will carry out the contracts with the different entities that participate in the execution of the technical activities, this will be done through an evaluation process and through Derivative Agreements, both framework and derivative agreements will have the specific conditions or guidelines required by Colombian regulations, CAF, and in consequence, GCF.
126. On a preliminary basis, the Consortium of International Agricultural Research Centers (CGIAR), through CIAT, has been identified as the main procured party for the Project. The CGIAR is an international entity based in France that operates worldwide and is one of the [accredited entities](#) to the GCF. The CGIAR includes a network of international research centers such as CIAT, the Center for the Improvement of Corn and Wheat (CYMMIT), among others. CIAT is an agricultural research institution that was formally established in 1967, and has strong relationships with national research programs in Colombia in different crops with gremios such as FEDEARROZ, FENALCE, FEDEGAN, CENICAÑA, ASBAMA, AGROSAVIA, CIPAV, and joint works with CGIAR international research centers such as CIMMYT. On December 31, 2012, MADR and CIAT signed Agreement N ° 20120382 by means of which they established that they will work together with the objective of "joining efforts, resources and capacities to strengthen the adaptation capacity of the agricultural sector to variability and climate change and improve the efficiency of the use of resources in the productive systems in prioritized regions, in accordance with those Science Technology and Innovation (STI) instruments available to the parties".

127. **Role of National Designated Authority (NDA).** In Colombia, the National Planning Department (DNP) is the Designated National Authority (NDA), which supports its decision-making in a Collegiate Body made up of the Ministry of Environment and Sustainable Development (MADS), the Ministry of Finance and Public Credit (MHCP), the Ministry of Foreign Affairs (MRE), the Presidential Agency for International Cooperation and the DNP, which exercises the Technical Secretariat of the Collegiate Body. The Collegiate Body is an instance whose objective is to promote the mobilization of financing resources from the GCF in accordance with its result areas, generating the tools and mechanisms that support the analysis and decision-making of the NDA. In this case, the Project has undergone a review by the Collegiate Body and has incorporated the comments provided. This process has verified the alignment of the Project to the goals of the National Development Plan 2018-2022, the contribution to the strategies and goals of the National Climate Change Policy, the Green Growth Policy, and the Predicted and Determined Contribution at the national level. (NDC), as well as coverage at the municipal level (project scale), and other criteria aligned with the investment criteria of the GCF.
128. **Engagement with civil society organizations and other relevant stakeholders, including indigenous peoples, women and other vulnerable groups.** During project development, consultations were held with various groups, including male and female producers, farmer associations officials, extension workers, ethnic groups, local and national institutional actors. A total of 24 group work sessions were held with 86 officials from 14 national institutions directly linked to the issue of adaptation and mitigation of climate change in the agricultural sector and the participation of 39 CGIAR experts on different crops and topics. These sessions were complemented with multiple bilateral working sessions to discuss specialized topics related to climate challenges and the technologies to face them. Additionally, for the analysis of Environmental and Social Safeguards and Gender Analysis, 52 consultations and group sessions were held with extension agents, producers, ethnic groups and institutional actors at the territorial and national level on perceptions and recommendations for the implementation of the project, reaching a participation of 205 people, 131 men and 74 women, who were asked for recommendations to guarantee success in including the gender approach in the project, among other aspects. The details of the recommendations are found in section G.2 and in Annex 8. Under the Gender Action Plan, the project will implement several of the actions that will be implemented with the direct beneficiaries (women producers), but also with indirect ones (for example, from producers' households) in order to promote greater participation of rural women in the project. The summary of the history of consultations that were carried out to develop the project is in Annex 7.

#### D.6. Efficiency and effectiveness (max. 500 words, approximately 1 page)

129. **Financial Structure.** As mentioned in section B.5, the project proposes a combination of loans (assumed by the Government of Colombia) for an amount of USD 35.3 million. On the other hand, the local counterpart amounts to USD 16.56 million of direct co-financing from farmer associations and other institutions in Colombia. This means that 48.3% of the total amount of the project are grants, minimizing the concessionality of the GCF funds. GCF financing and its financial instruments including grants, combined with CAF funds, reduces the cost of loans for this Project. On the other hand, it is expected that with the Project, and in addition to the co-financing of the farmer associations of the various production chains, additional investments will be made (not counted as co-financing) by the private sector, once there is a greater adoption of the practices and technologies developed and validated by the project.
130. **Efficiency and effectiveness.** The ex-ante economic analysis for the implementation of the CSICAP project considers eight agricultural activities: livestock (milk, beef), sugar cane, sugar cane, coffee, corn, rice and potatoes. The economic benefits of the project for society (producers and consumers) are analyzed due to the increase in production performance, the reduction of losses and the reduction of production costs as a result of: (i) adoption of technologies for management agroclimatic risk and digital agriculture, (ii) genetic improvement and (iii) efficient use of water resources. This analysis considers incremental benefits over 25 years, which is the useful life of the technologies considered. This evaluation considered the most probable scenario of technological impact and two opposite scenarios (maximum and minimum) of technology adoption by producers, as well as the probability of success in the implementation.
131. The results in Annex 3 show an average IRR of 201%, which results from the high impact of making climate smart technologies available at scale for producers and generating high returns at the producer level. It is worth noting that despite this high rate of return in the targeted value chains. In this case, despite the high level of IRRs, reimbursable instruments to the producers (instead of grants) are not viable because the kind of investments are usually not financed to farmers (as most of them are public goods). That is, there are no commercial financing sources available in Colombia for the type of investments (gene banks and seed improvement, big data, GHG emission measurement, etc.) considered by the project. Since the project represents a public good investment, as around 10 percent of total project costs go to public infrastructure that do not have direct revenue generation potential, without GCF and CAF support, the government would need to look for another unlikely available similar sources of funding. GCF offers a unique opportunity for blending low interest loans and grants, reducing the financial cost of the project, and representing a specialized source, especially designed to enhance climate resilience and

mitigate GHG emissions. As the sensitivity analysis shows (Table 6 in Annex 3), the project is not feasible if the grant share is reduced by 75%. A 35% grant reduction will make the project unprofitable for two producer associations (Fedegan and Asocaña-Cenicaña) and technically unfeasible given the importance of livestock in GHG emission reductions. Reducing the grant will cause many activities not to be completed or even undertaken, affecting the expected productivity increase, cost reduction, and technology adoption rate, undermining the overall project's success probability.

132. Annex 3 also provides a more realistic economic evaluation, where we have used the modified IRR (Marin-Salazar, et al. 2019), which takes into account the actual reinvestment rate (usually lower than the regular IRR's). As a result, the revised overall project's modified internal rate of return (MIRR), considering a return of 12% and a real interest rate of 3.5%, is 24%, which is still attractive enough to justify the public investments. For each crop, depending on the technologies and the level of adoption (between 10% and 37%), the MIRR varies between 17% and 29%. For most of the crops considered, the MIRR values are above 14%, which is the average rate for agriculture projects in Latin America and the Caribbean. The net present value (NPV) of the investments for the eight agricultural sectors would be around USD 3.3 billion under a conservative scenario of technology adoption. These results show that the application of concrete measures, within the reach of producers and easily implemented to promote the closing of productive gaps, will increase the competitiveness of the agricultural sector, having tangible benefits in terms of economic returns from these investments. The benefit-cost ratio (BCR) of the technologies is 103 for the project, varying between crops between 17.6 and 219.5, depending on the level of adoption of the technologies (see detailed table in Annex 3).

133. **Best available technologies and practices.** The project will make use of best practices and innovative technologies that have been previously tested and that have been validated in the reality of the Colombian agricultural sector. Specifically, and as described in section B.3, a Big Data platform will be developed and operated for the supply of analyzed and processed information and the empowerment of the farmer associations to achieve the delivery of recommendations for adaptation and mitigation measures. to producers in a reliable, timely and site-specific manner, resulting in agility and lower cost for the provision of the agricultural extension service (Product 1.1). The design and implementation of early warning platforms, the generation of climate predictions, the use of simulation models and Big Data information, will provide accurate and timely information to farmers (Result 1.2). Under Component 2 of genetic improvement, crop management techniques and other technological options and their scaling, new varieties tolerant or resistant to water deficit, waterlogging and diseases will be used, developed and validated and seeds adapted to these conditions will be multiplied in a massive way (Product 2.1). Under Result 2.2, sustainable management practices will be formulated and implemented on a large scale, including the incorporation of agroforestry arrangements, rational management of fertilizers and the use of bioproducts, optimization of irrigation systems, conservation agriculture, and use of waste. harvesting, low-emission planting materials, conservation and restoration of strategic areas at the landscape level, optimization of processing systems, and water harvesting. In livestock farming, grassland management, animal welfare, and good livestock practices will also be worked on.

## E. LOGICAL FRAMEWORK

This section refers to the project/programme's logical framework in accordance with the GCF's [Performance Measurement Frameworks](#) under the [Results Management Framework](#) to which the project/programme contributes as a whole, including in respect of any co-financing.

### E.1. Paradigm shift objectives

Please select the appropriated expected result. For cross-cutting proposals, tick both.

- Shift to low-emission sustainable development pathways  
 Increased climate resilient sustainable development

### E.2. Core indicator targets

Provide specific numerical values for the GCF core indicators to be achieved by the project/programme. Methodologies for the calculations should be provided. This should be consistent with the information provided in section A.

E.2.1. Expected tonnes of carbon dioxide equivalent (t CO <sub>2</sub> eq) to be reduced or avoided (mitigation and cross-cutting only)	Annual	366,081 t CO <sub>2</sub> eq
	Lifetime	9,152,034 t CO <sub>2</sub> eq
E.2.2. Estimated cost per t CO <sub>2</sub> eq, defined as total investment cost / expected lifetime emission reductions (mitigation and cross-cutting only)	(a) Total project financing	<u>99,910,201</u> USD
	(b) Requested GCF amount	<u>73,283,080</u> USD
	(c) Expected lifetime emission reductions	<u>9,152,034</u> t CO <sub>2</sub> eq
	<b>(d) Estimated cost per t CO<sub>2</sub>eq (d = a / c)</b>	<u>10.9</u> USD / t CO <sub>2</sub> eq
	<b>(e) Estimated GCF cost per t CO<sub>2</sub>eq removed (e = b / c)</b>	<u>8.01</u> USD / t CO <sub>2</sub> eq <sup>17</sup>
E.2.3. Expected volume of finance to be leveraged by the proposed project/programme as a result of the Fund's financing, disaggregated by public and private sources (mitigation and cross-cutting only)	(f) Total finance leveraged	<u>26,627,121</u> USD
	(g) Public source co-financed	<u>10,300,000</u> USD
	(h) Private source finance leveraged	<u>16,327,121</u> USD
	<b>(i) Total Leverage ratio (i = f / b)</b>	<u>0.36</u>
	(j) Public source co-financing ratio (j = g / b)	<u>0.14</u>
	(k) Private source leverage ratio (k = h / b)	<u>0.22</u>
E.2.4. Expected total number of direct and indirect beneficiaries, (disaggregated by sex) <sup>18</sup>	Direct	619,691 20% of female
	Indirect	347,996 20% of female
E.2.5. Number of beneficiaries relative to total population (disaggregated by sex)	Direct	1.21% (Expressed as %) of total population in Colombia (51,273,917 people)
	Indirect	0.68% (Expressed as %) of total population in Colombia (51,273,917 people)

<sup>17</sup> It is important to note that approximately 13% of the GCF contribution is considered within the mitigation results area (see section A4), around USD 9,526,800. If we account only for this funding to estimate the GCF cost per t CO<sub>2</sub>eq, the cost is USD 1.04 per t CO<sub>2</sub>eq (USD 9,526,800 / 9,152,034 t CO<sub>2</sub> eq = 1.04 USD / t CO<sub>2</sub>eq).

<sup>18</sup> See section D1 and Annex 24 for further details regarding the calculations and assumptions for direct and indirect beneficiaries.

### E.3. Fund-level impacts

Select the appropriate impact(s) to be reported for the project/programme. Select key result areas and corresponding indicators from GCF RMF and PMFs as appropriate. Note that more than one indicator may be selected per expected impact result. The result areas indicated in this section should match those selected in section A.4 above. Add rows as needed.

Expected Results	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
<i>M4.0 Reduced emissions from land use, reforestation, reduced deforestation, and through sustainable forest management and conservation and enhancement of forest carbon stocks</i>	<i>M4.1 Tonnes of carbon dioxide equivalent (t CO<sub>2</sub> eq) reduced or avoided (including increased removals) - forest and land use</i>	Measurement of emissions in the field and estimation of emissions according to the area of improved crops and livestock.  National GHG inventories for agriculture in Colombia (if available for the targeted value chains).	0  No project interventions	98,961	498,190	Farmers adopt technological packages and best practices in crop and livestock management.  Detailed assumptions regarding the calculations are included in Annex 22, including: - Project lifetime: 25 years - Annual emission reductions: 366,081 t CO <sub>2</sub> eq - Lifetime emission reductions: 9,152,034 t CO <sub>2</sub> eq
<i>A1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities and regions</i>	<i>A1.2 Number of males and females benefiting from the adoption of diversified, climate resilient livelihood options (including fisheries, agriculture, tourism, etc.)</i>	Monitoring platform, field surveys, data collection.  Secondary data: annual datasets of some producer's associations; i) Rice: ENAM; ii) Fenalce, <sup>19</sup> iii) Coffee Federation datasets (annual stats); iv) Fedepanela.	0  No project beneficiaries	16,200  (80% male, 20% female)	54,000 <sup>20</sup>  (80% male, 20% female)	The capacities created in the farmer associations are maintained and renewed periodically and catalyze a better management of climate risks.  Support structures / services for the implementation of best agricultural practices are available and trained.  The male and female breakdown is based on the previous experiences where only 5.4% of producers were female heads of household.
<i>A2.0 Increased resilience of health and well-being, and food and water security</i>	<i>A2.2 Number of food secure households (in areas/periods at risk of climate change impacts)</i>	Monitoring platform, field surveys, data collection.	1,113,514 <sup>22</sup> secure households in the rural	1,115,514 secure households	1,123,514 secure households	Farmers implement technology packages managing to be prepared for any adverse weather event

<sup>19</sup> ENAM is the National Mechanized Rice Survey (ENAM for its acronym in Spanish) carried out by FEDEARROZ and the National Administrative Department of Statistics (DANE for its acronym in Spanish) twice a year, sample size around 700- 800 producers. FENALCE sample size around 700-800– annual. FEDEPANELA sample size around 400-500 farmers

<sup>20</sup> To estimate the 54,000 people, we used number of direct beneficiaries (just producers, not family members), multiplied by the adoption rates from the ex-ante evaluation (see Annex 23) and other studies which indicate the average level of agricultural technology adoption is 28%. In this case, we only count those producers that actually adopt the technologies and practices and benefit from them.

<sup>22</sup> The households are calculated based on the rural population divided by the average size of people per household (3.1) and the percentage of people with food insecurity in Colombia (ENSIN, 2015)

		Secondary source: National Budget of Household expenses (ENPH) <sup>21</sup> -DANE.	departments where project interventions will be carried out. (23.8% household led by women)	(23.8% household led by women. This implies 2,000 households in food security)	(23.8% household led. This implies at the end of the project 10,000 households in food security)	that may affect their production and thus increase their probability of achieving food security.  Food security is the safe and permanent access of the members of a household to sufficient food in quantity and quality, for a healthy and active life. FAO. Escala Latinoamericana y Caribeña de Seguridad Alimentaria (ELCSA): Manual de Uso y Aplicaciones. 2012
<i>Social, environmental, economic co-benefit</i>	<i>Social, environmental, economic co-benefit index/indicator at the impact level</i>  Percentage increase in household income from agricultural activities	Baseline, intermediate and final surveys  Secondary source: National Budget of Household expenses (ENPH) - DANE.	Average net income (USD per hectare): <sup>23</sup>  Rice: 356  Sugarcane : 73  Bananas: 1,911  Coffee: 757  Livestock (meat): 127  Livestock (milk): 21  Corn: 407  Panela Cane: 312  Potato: 629	4.4%	14.6% <sup>24</sup>	Farmers, aware of the risks of climate variability and change, adopt technologies that make them more resilient to any adverse event while increasing their productivity and being able to sell more, which leads to an increase in household income generated by agricultural activities.  Baseline values were calculated from average yield and price data for each crop

#### E.4. Fund-level outcomes

Select the appropriate outcome(s) to be reported for the project/programme. Select key expected outcomes and corresponding indicators from GCF RMF and PMFs as appropriate. Note that more than one indicator may be selected per expected outcome. Add rows as needed.

Expected Outcomes	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term)	Final	

<sup>21</sup> Survey that provides information on the structure of spending and household income that allows establishing consumption patterns of the inhabitants of Colombia, in which adequate food consumption indices can be constructed. Survey conducted every 10 years. Next survey 2026.

<sup>23</sup> Estimated based on average yield (ton/ha), price (Colombian pesos /Ton), exchange rate with USD and cost per hectare.

<sup>24</sup> Percentage change is based on average observed value from the ex-post analysis of previous interventions (see Annex 23).

<p>M9.0 Improved management of land or forest areas contributing to emissions reductions</p>	<p><i>M9.1 Hectares of land or forests under improved and effective management that contributes to CO2 emission reductions</i></p>	<p>Primary data: Monitoring platform, field surveys, data collection</p> <p>Secondary data: annual datasets of some producer's associations; i) Rice: ENAM<sup>25</sup>; ii) Cattle: datasets from FEDEGAN; iii) Coffee Federation datasets; iv) RENARE: datasets from national platform of GHG reduction projects.</p>	<p>55,263 ha</p> <p>(It is equivalent to hectares under silvopastoral systems in cattle (38,390 ha) and hectares under the AMTEC 2.0<sup>26</sup> system for rice (16,873 ha) of the departments where the project interventions will be carried out)</p>	<p>57,373 ha.</p> <p>This implies 2,119 ha (full invest) under sustainable management practices following the guidelines of the project</p> <p>Rice: 363 ha Corn: 218 ha Panela: 160 ha Potato: 145 ha Livestock: 929 ha Plantain: 303 ha</p>	<p>64,013 ha</p> <p>This implies 8,750 ha (full invest) under sustainable management practices following the guidelines of the project:</p> <p>Rice: 1500 ha Corn: 900 ha Panela: 660 ha Potato: 600 ha Livestock: 3,840 ha Plantain: 1,250 ha</p>	<p>Farmers adopt technological packages and best practices in crop and livestock management that contribute to the reduction of CO<sub>2</sub> emissions</p> <p>Description of assumptions for calculations are include in Annex 22, and in section D1.</p> <p>Means of verification are described in Annex 11.</p>
<p>A6.0 Increased generation and use of climate information in decision-making</p>	<p><i>A6.1 Use of climate information products/services in decision-making in climate sensitive sectors</i></p>	<p>Primary data: Surveys and training activities to technicians.</p> <p>Secondary data: Producers associations' reports about the use of their platforms.</p>	<p>Annual agriculture sector plans by gremios are updated using data on the meteorological and early warning systems, and relevant sectoral and extension officers are trained in the interpretation of agroclimatic forecast, leading to a reduction of losses in</p>	<p>Annual agriculture sector plans by gremios are updated using data on the meteorological and early warning systems, and relevant sectoral and extension officers are trained in the interpretation of agroclimatic forecast, leading to</p>	<p>Annual agriculture sector plans by gremios are updated using data on the meteorological and early warning systems, and relevant sectoral and extension officers are trained in the interpretation of agroclimatic forecast, leading to a reduction of losses in agricultural production amounting to USD 300,000/year.</p>	<p>Climate information products and services are developed and adopted by the gremios to train extension technicians on time to provide information to farmers in the field. They use the technology designed to reduce possible losses due to climatic factors and make them more resilient.</p> <p>This assumes that gremios already have climate services improve their capacity regarding climate services, and those gremios that do not have systems in place, improve their stance compared to the baseline</p>

<sup>25</sup> ENAM is the National Mechanized Rice Survey (ENAM for its acronym in Spanish) carried out by FEDEARROZ and the National Administrative Department of Statistics (DANE for its acronym in Spanish) twice a year.

<sup>26</sup> AMTEC is the Mass Adoption of Technology designed and conceived by the National Rice Fund (FEDEARROZ for its acronym in Spanish) to disseminate and transfer best-management practices for rice producers to increase yield and reduce cost of production (Ramirez and Bedoya, 2019).

			agricultural production amounting to USD 100,000/year <sup>27</sup> .	a reduction of losses in agricultural production amounting to USD 150,000/year.		
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	<i>A7.1 Use by vulnerable households, communities, businesses and public-sector services of Fund-supported tools instruments, strategies and activities to respond to climate change and variability</i>	Monitoring platform, field surveys, data collection  Secondary data: annual datasets of some producer's associations; i) Rice: ENAM; ii) Cattle: datasets from FEDEGAN; iii) Coffee Federation datasets; iv) Other associations	0 (as there are no Fund-supported tools, instruments, strategies and activities)	16,077 are the new users of these tools as a result of the project are composed as follows:  Rice 653 Potato 2,543 Sugar cane 227 Panela cane 1,976 Dairy farming 1,363 Livestock 1,363 Corn 1,098 Banana 88 Coffee 6,480 Gremios: Two (2) strategies (80% male, 20% female household heads)  Farmers have	53,590 new users of these tools as a result of the project are composed as follows:  Rice 2,175 Potato 8,476 Sugar cane 758 Panela cane 6,586 Dairy farming 4,544 Livestock 4,544 Corn 3,659 Banana 294 Coffee 21,600 Gremios: Four (4) strategies (80% male, 20% female household heads)  Farmers have adapted and have an income increase of 14.6%	The technologies, tools, strategies are available and respond to the needs of the sector.  The information is disseminated and the organizations / institutions know it  At least 5 gremios strategies included information and some tools of the project.  Based on the baseline, mid-term and final project surveys, short surveys after each event the project will monitor whether participants use the tools, instruments, etc., generated by the project.

<sup>27</sup> Through the ex-post impact evaluation, we quantified and understood the effects of the activities carried out within the technical agreement framework since 2013. These activities focused mainly on rice and maize. The analysis was based, on primary information collected in the field using face-to-face surveys made to producers of the two crops. The survey instruments used allowed us to describe different dimensions of the producers, like household composition, production decision-making, agronomic management, information-technical assistance, exposure to adverse weather events, adoption of resilient practices, living conditions, among others. The results of the ex-post impact evaluation showed that there are heterogeneous effects by type of crop and intervention. For more details see Annex 23 and Gallego, J., Wiesner, D., Jerez, K., Betancourth, A., Ortega, J., Bateman, A., González, C., Andrade, R., Ibarra, L., Álvarez, A. and Cubillos, N. (2021). Intervenciones en Colombia - Cambio Climático: Evaluación de Impacto Informe final - resultados y recomendaciones. (Interventions in Colombia – Climate Change: Impact Evaluation Final Report – Results and Recommendations). Unpublished

				adapted and have an income increase of 4.4%		
A8.0 Strengthened awareness of climate threats and risk-reduction processes	<i>A8.1 Number of males and females made aware of climate threats and related appropriate responses</i>	<p>Surveys and focal groups</p> <p>Secondary data: annual datasets of some producer's associations; i) Rice: ENAM; ii) Cattle: datasets from FEDEGAN; iii) Coffee Federation datasets; iv) Other associations</p>	57,978 farmers and technicians <sup>28</sup>	95,745 (80% male, 20% women)	224,916 (80% male, 20% women)	<p>Agro-climatic information generated is received effectively, which maintains farmers' interest in actively participating in the project</p> <p>The tools are available and respond to the needs of technicians and producer associations. Technicians participate in the training activities.</p> <p>The same methodologies used for ENAM and AMTEC surveys shall be applied to measure the performance every year.</p>
	Number of technologies and innovative solutions transferred or licensed to support low-emission and climate resilient development as a result of GCF support	<p>Monitoring platform, field surveys, data collection</p> <p>Secondary data: annual datasets of some producer's associations; i) Rice: ENAM; ii) Cattle: datasets from FEDEGAN; iii) Coffee Federation datasets; iv) Other associations</p>	0	<p>A total of 9 new measures and 0 adopted technology</p> <p>- Measures (9): sustainable in livestock, landscape restoration (sugar cane and livestock), efficient fertilizer use (potato and rice). low water consumption (rice and potato), land restoration (musaceae and potato).</p>	<p>A total of 20 new measure and 3 adopted technologies</p> <p>- Measures (20): sustainable in livestock, landscape restoration (sugar cane and livestock), low water consumption (rice, potato, sugar cane and musaceae), efficient fertilizer use (potato, corn, rice, panela and musaceae), land restoration (musaceae, potato, sugar cane and livestock), low carbon techniques (rice, corn, potato,</p>	<p>The technologies, tools, strategies are available and respond to the needs of the sector.</p> <p>The information is disseminated and the organizations / institutions know it</p> <p>Farmers adopt technological packages and best practices in crop and livestock management that contribute to the reduction of CO<sub>2</sub> emissions</p>

<sup>28</sup> ENAM and AMTEC surveys.

				- Technologies:0	panela, livestock and musaceae)  - Technologies (3): new varieties for rice, corn and sugar cane	
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### E.5. Project/programme performance indicators

The performance indicators for progress reporting during implementation should seek to measure pre-existing conditions, progress and results at the most relevant level for ease of GCF monitoring and AE reporting. Add rows as needed.

Expected Results	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
1.1 Strengthened and modernized agricultural extension system with an emphasis on adaptation and mitigation	Percentage of farmers/technicians who perceived that their knowledge improved as a result strengthened and modernized agriculture extension system differentiated by gender	Monitoring Platform (1) and surveys (3) directly with technicians after training sessions	N/A	15%	60%	<p>The 2,200 farmers remain interested and actively participate in the project activities.</p> <p>Local producer organizations and associations support the initiative and are willing to participate.</p> <p>Values are based on past observed results from similar experiences</p>
1.1 Strengthened and modernized agricultural extension system with an emphasis on adaptation and mitigation	Percentage of farmers that use as source of information for agroclimatic services (bulletins, early warning text messages, online information), those promoted by the gremios	Surveys and user information from the gremios' platforms	21.5% of farmers <sup>29</sup>	25% of farmers	32.25% of farmers	<p>Forecast information is used by farmers as a source for management decision making. The target assumes an increase in 50% from the baseline of the percentage of farmers that use the agroclimatic services.</p> <p>To account for quality, the definition of "use" will be that "information received is understood and it was useful"</p>
1.2 Agroclimatic services in place and/or strengthened	Number of farmers aware of and who know how to differentiate climate risks, their effects and related mitigation measures, differentiated by gender	Surveys and focal groups	57,665 farmers <sup>30</sup>	94,681 This includes 29,612 target farmers (20% women)	222,097 This includes 98,710 target farmers (20% women)	Agro-climatic information generated is received effectively, which maintains farmers' interest in actively participating in the project
2.1. Strengthened germplasm bank, new climate resilient varieties developed and their seeds massively distributed	Area planted (in hectares) under the variety or using seeds recommended for the area	Surveys and secondary data from gremios. Secondary data: annual datasets of some producer's associations; i) Rice: ENAM; ii) Fenalce, iii)	190.000 ha <sup>31</sup>	193,600 ha This includes 3,600 target hectares during project implementation	202.000 ha This includes 12,000 ha during the project implementation	Field activities for variety development are not delayed by severe weather events

<sup>29</sup> Gallego et al, 2021

<sup>30</sup> ENAM and AMTEC surveys.

<sup>31</sup> Impact Evaluation of the Pilot, 2021.

		Coffee Federation datasets (annual stats); iv) Fedepanela				
2.2. More efficient use of water resources, restoring soil properties, and improving GHG mitigation practices by farmers and gremios through the adoption of new climate smart practices and technologies	Area (in hectares) under efficient water use practices	Surveys, GIS tools.  Secondary data: annual datasets of some producer's associations; i) Rice: ENAM; ii) Fenalce, iii) Coffee Federation datasets (annual stats); iv) Fedepanela	N/A	758	1,896	Farmers remain interested and actively participate in the project activities. Extension activities are effective and executed in a timely manner
3.1. Improved business models that provide farmers with reasonable profits and improved GHG mitigation practices	Number of value chains developing novel and inclusive business models to boost climate resilient and low emissions agriculture	Baseline, intermediate and final surveys	N/A	2	4	Gremios perceived the strengthening of their capacities for implementing novel and inclusive business models.
3.1 Improved business models that provide farmers with reasonable profits and improved GHG mitigation practices	Number of financial institutions aware of the project benefits and opportunities and involved in projects activities	Baseline, intermediate and final interviews	N/A	7	10	Financial Institutions (FIs) participated actively in the project. In the framework of this project, we will focus in FIs with current activities in the agricultural sector. By FIs we refer to national financial institutions such as Finagro and Fiduagraria, commercial banks (e.g., Banco Agrario, Bancamía, Banco W), microfinance institutions (e.g., CONTACTAR, FINANFUTURO), cooperatives (e.g., CONFIAR, CoopKennedy) and insurance companies (e.g., Mapfre).
3.2. Modernized technical assistance and agricultural extension services with multi-tool strategies, differentiated and adapted to specific environmental, social, gender and productive contexts at the national level	Percentage of crop loss due to climatic effects	Baseline, intermediate and final surveys Sendai Indicators	20.9% <sup>32</sup>	19.8% (equivalent to a reduction of 5% from baseline)	16.7% (equivalent to a reduction of 20% from baseline)	Farmers adopt recommendations and adopt technologies to increase their resilience to adverse weather events and thereby reduce crop losses.

<sup>32</sup> Gallego et al, 2021 – Annex 23

3.2. Modernized technical assistance and agricultural extension services with multi-tool strategies, differentiated and adapted to specific environmental, social, gender and productive contexts at the national level	Reduced incidence of climate induced pests and diseases	Baseline, intermediate and final surveys	5.8% <sup>33</sup>	5.5% (equivalent to a reduction of 5% from baseline)	4.6% (equivalent to 20% from baseline)	Farmers adopt the recommendations of experts in precision agriculture where they manage to reduce the impact of climate induced pests and diseases on their crops.
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**E.6. Activities**

*All project activities should be listed here with a description and sub-activities. Significant deliverables should be reflected in the implementation timetable. Add rows as needed.*

Activity	Description	Sub-activities	Deliverables
<b>Result 1.1. Strengthened and modernized agricultural extension system with an emphasis on adaptation and mitigation</b>			
Activity 1.1.1	Organize the information from the different repositories and producer association databases (public and free-access systems) to connect them with updated information available from existing free-access platforms through remote sensing or other sources.	SA1. Development of a strategy for data collection associated with environmental, social, technological, production and economic indicators. SA2. Development of a protocol for the integration of databases with existing crop information. SA3. Processing and cleansing of database information. SA4. Consolidation of processed information in a database management system. SA5. Data analysis using methods based on machine learning and computational optimization. SA6. Dissemination of the results to validate recommendations in the field. SA7. Development of algorithms for data analysis. SA8. Design or adjustment of platforms for capturing, storing and disseminating information.	Site-specific management recommendations for 381,000 hectares / 46,056 producers for seven (7) crops (rice, maize, potato, panela sugarcane, livestock, banana and plantain) in 213 municipalities. Seven (7) Big Data platforms providing site-specific recommendations for 381,000 hectares / 46,056 producers for seven (7) crops (rice, maize, potato, sugarcane, livestock, banana and plantain) in 213 municipalities
Activity 1.1.2	Develop a bot-based digital instrument to strengthen the extension service. There are plans to develop communication tools that facilitate human-machine interaction to provide automatic answers to frequently asked questions in conversations between farmers and technicians. This will facilitate sharing the recommendations derived	SA1. Development of mass dissemination systems based on a bot (automatic response interaction system) to strengthen the extension services of the producer associations. SA2. Engaging with potential users to collect a baseline of the information more frequently required for decision making through workshops, interviews,	Bot service providing recommendations to 15,256 producers for three (3) crops (rice, maize and potato).

<sup>33</sup> Gallego et al, 2021 – Annex 23

	from data analysis, as well as agroclimatic forecasts.	questionnaires and possibly focus groups. SA3. Creating an automatic wizard to exchange agroclimatic information with producers, through chats or text messages on planting dates, choice of varieties and rain forecasts, among others.	
Activity 1.1.3	Design and develop the entire data mining and analysis operating system that will allow interconnecting all available information. In turn, systems will be developed to enable the automatization of analysis and modeling processes, in an effort to encourage more robust recommendations and more agile and efficient processes	SA1. Identification of variables to improve site-specific analysis and recommendations. SA2. Instrumentation to capture information using remote sensors (drones) and non-remote sensors (yield sensors, soil moisture, electroconductivity, leaf wetness sensors, etc.). SA3. Development of a data management routine to allow the integration of the information collected by the instrumentation to Big Data platforms.	1,215 professionals and technicians linked to seven (7) crops (rice, maize, potato, panela sugarcane, livestock, banana and plantain) trained.
Activity 1.1.4	Train technicians in the use and application of advanced data analysis methods, including: i) holding in-person and virtual training workshops, and short-term stays of professionals from producer associations at CIAT and other centers of excellence, to develop skills in the use of data mining, evolutionary computing and remote sensors to generate information for decision-making in the field; ii) Developing, validating and implementing a module based on graphical interfaces to facilitate data analysis and consultation, aimed at producer association technicians; iii) Training of trainers on Information Literacy for producers with an ethnic and gender focus and develop and implement dissemination means, including communication platforms.	SA1. Design and implementation of a training, dissemination and promotion program on the use, requirements and advantages of using the Big Data platform aimed at technicians of the producer associations, other practitioners, producers and other relevant stakeholders. SA2. Developing, validating and implementing a module based on graphical interfaces to facilitate data analysis and consultation, aimed at producer association technicians SA3. Training of trainers on Information Literacy for producers with an ethnic and gender focus and develop and implement dissemination means	1,215 professionals and technicians linked to seven (7) crops (rice, maize, potato, panela sugarcane, livestock, banana and plantain) trained.
<b>Result 1.2. Agroclimatic services in place and/or strengthened</b>			
Activity 1.2.1	Design and/or strengthen agroclimatic information services. It seeks to expand the coverage of information	SA1. Evaluation of climate forecasts at different time scales (e.g., seasonal, sub-seasonal) exploring the	Four (4) improved agroclimatic platforms with better forecasting performance (sugarcane,

	<p>services to reduce the agroclimatic risk for new productive systems (potatoes, panaleta sugarcane, livestock, banana and plantain) and strengthen existing agroclimatic information services which function independently for rice, corn, sugarcane and coffee.</p>	<p>influence of meteorological factors (e.g., tropical activity in the Atlantic Ocean) on seasonal climate behavior and include their effect in seasonal projections. SA2. Developing a network to collect climate information (meteorological stations network) in prioritized sites . SA3. Identifying and mapping areas that are vulnerable to experience water and biological stress, based on their water supply. SA4. Creating, structuring and implementing the Cenicaña AgroClimate Service for the Cauca River Valley, including the automation of the productivity prediction system for sugarcane and the analysis of climatic variables. SA5. Adjusting and validating climate prediction models in coffee and its relationship with diseases, and making recommendations.</p>	<p>coffee, rice and maize) serving 89,000 producers. Five (5) new agroclimatic platforms in operation (potato, panaleta sugarcane, livestock, banana and plantain) serving 37,123 producers.</p>
<p>Activity 1.2.2</p>	<p>Develop more accurate and precise climate and weather prediction models and complementary improved crop simulation models by using new-generation climate models, improving the performance of climate prediction models, modeling crop physiological processes, including alerts for pests, diseases and other abiotic factors (for example, frosts), and irrigation planning and optimization.</p>	<p>SA1. Evaluation of climate forecasts at different time scales (e.g., seasonal, sub-seasonal) exploring the influence of meteorological factors (e.g., tropical activity in the Atlantic Ocean) on seasonal climate behavior and include their effect in seasonal projections for eight crops (rice, maize, potato, panaleta sugarcane, livestock, coffee, banana and plantain). SA2. Develop and implement new methods for calibration of simulation models (e.g., generic variety groups), as well as protocols for data capture during experimental evaluations (i.e., crop improvement group, and crop monitoring). Set-up of experimental plots to collect information useful for model calibration. SA3. Calibration of simulation models under different agronomic management conditions (irrigation and fertilization) through the evaluation of water and nitrogen balance modules.</p>	<p>Calibrated simulation models for eight crops (rice, maize, potato, panaleta sugarcane, livestock, coffee, banana and plantain) for 24 sets of genetic materials.  Bioclimatic evaluation and characterization of livestock production regions in Colombia.  Development and calibration of pest and disease alert prediction models (based on climate) for three (3) crops (rice, coffee and panaleta sugarcane).  A 1–10-day time-scale forecasting service for rice.  A 1-to-3-week sub-seasonal forecasting service for rice.</p>

		SA4. Performance evaluation of simulation models at the level of commercial plots. SA5. Determine the uncertainty resulting from climatic and agronomic modeling and their coupling. SA6. Analysis of climatic and biophysical variables in livestock production areas.	
Activity 1.2.3	Connect agroclimatic forecasts with artificial intelligence models (Result 1.1).	SA1. Integration of agroclimatic information to mass dissemination systems (bot). SA2. Usability tests with producers of agroclimatic platforms and mass dissemination systems. SA3. Adjustments in outputs and generation of new services based on needs. SA4. Generation of visualization interfaces targeted at different users according to agroclimatic information needs.	One million producers receive agro-climatic recommendations through agro-climatic platforms and bot services for seven (7) crops (rice, maize, potato, panaleta sugarcane, banana, plantain and sugarcane) and livestock production.
Activity 1.2.4	Strengthen mechanisms to disseminate agroclimatic information and transfer capacities .	SA1. Design and implementation of a training, dissemination and promotion program on the use, requirements and advantages of using the agroclimatic platforms, targeted at technicians of the producer associations, other practitioners, producers and other relevant actors. SA2. Strengthening of the mechanisms for co-production, translation, transfer and use of agroclimatic information in the existing Agroclimatic Technical Committees (MTAs). SA3. Operation and creation of new Agroclimatic Technical Committees (MTAs).	961 people trained in six (6) crops (rice, maize, potato, sugarcane, banana and plantain) and livestock production.  Operation of all existing MTAs (13 MTAs).  Creation and operation of at least 2 MTAs.
Activity 1.2.5	Other activities related to producing, transferring or using agroclimatic information (automation of meteorological information, analysis of climate change signals, nutrient balance models).	SA1. Model, through the use of information generated by Cenicafe and new research, the inputs and outputs of nutrients in coffee production systems in the face of climate variability. SA2. Analysis of historical climate information from the network of stations in the sugarcane sector. SA3. Evaluate the water balance and fertilization modules of the rice crop	Development of a model of nutritional alerts (based on climate) for coffee.  Exploration of climate change signals in the CRV (1994-2020) for the plain region of the Valle del Cauca department.  Water balance and fertilization modules for rice models developed.

		models, in order to broaden their application in decision making and in the optimization of natural and agro-industrial resources.	
<b>Result 2.1. Strengthened germplasm bank, new climate resilient varieties developed and their seeds massively distributed</b>			
Activity 2.1.1.	Develop a state-of-the-art phenotyping platform designed to identify low carbon production and climate-resistant genetic resources .	SA1. Install, calibrate and test growth chambers designed to simulate future climatic conditions by manipulating lighting, temperature and relative humidity. SA2. Install and test field equipment that supports image and sensor data capture SA3. Calibrate and test cameras and sensors to quantify the impact of abiotic stresses on photosynthesis. SA4. Sequencing of parental genetic material and/or progeny. SA5. Application of a genomic selection model.	A phenotyping platform developed and at the service of crops
Activity 2.1.2.	Identify heat, drought and excess water tolerant accessions for rice, maize, potatoes, Musaceae, and livestock (forages).	SA1. Detect physiological traits using the phenotyping platform established in Activity 2.1.1. SA2. DNA sequencing to identify regions of the genome that control the evaluated traits. SA3. Identify traits to increase crop resilience. SA4. Selection and evaluation under controlled conditions for water deficit, low nitrogen and waterlogging of elite parental lines.	5 accessions with tolerance to heat and drought identified for rice, forage, banana, corn and sugar cane crops
Activity 2.1.3.	Develop new varieties from advanced lines for climate change adaptation and mitigation for rice, maize, livestock, banana (varieties that are tolerant or resistant to water deficit and diseases that demand high use of chemical fungicides, such as black Sigatoka) and sugarcane (water deficit, waterlogging and greater efficiency in nitrogen use).	SA1. Establishment of experimental plots for the evaluation and selection of materials. SA2. Characterization and selection of lines, hybrids or varieties with tolerance to high night temperatures, low radiation and high CO <sub>2</sub> concentrations. SA3. New crosses with promising lines SA4. Validation and performance evaluation of materials developed in other countries but that have not been tested in Colombia. SA5. Selection of lines with better performance	8 new materials at the service of producers for rice, banana, fodder, corn and sugar cane crops

		SA6. Evaluation of greenhouse gas emissions of different genetic materials. SA7. Materials registration process and release of new materials.	
Activity 2.1.4.	Massive seed multiplication for coffee, sugarcane, panela sugarcane, potato, banana and plantain through in vitro culture or the buds method for distribution to farmers .	SA1. Establish thermotherapy protocol SA2. Cleaning by cryopreservation. SA3. Multiplication of material. SA4. Virus and disease detection. SA5. Implementation of the <i>in-vitro</i> technique of Somatic Embryogenesis (SE). SA6. Implement the use of bioreactors for scaling up.	four propagation protocols for potato, banana, coffee, sugar cane, and panela cane crops. Seedbeds of the species propagated to establish trials in 230 hectares for the same crops.
<b>Result 2.2. More efficient use of water resources, restoring soil properties, and improving GHG mitigation practices by farmers and gremios through the adoption of new climate smart practices and technologies</b>			
Activity 2.2.1.	Quantifying the baseline water footprint in six (6) crops (potato, sugarcane, panela sugarcane bananas, plantains, and livestock) and in the industrial phase of sugar production .	SA1. Definition and/or installation of crop plots for measurements. SA2. Purchase, installation and calibration of equipment. SA3. Data collection and recording of other variables of interest. SA4. Measurement of water consumption for different technologies and management techniques for the crops prioritized by the project. SA5. Collection of complementary information. SA6. Measurement of water footprints for different crops under different production models.	Water consumption values measured for the conventional management of five (5) crops (potato, panela sugarcane, sugarcane, plantain, banana) and livestock production in sixteen (16) areas of the country. Water footprints calculated for the conventional management of four (4) crops (potato, panela sugarcane, plantain, banana) and livestock production in sixteen (16) locations.
Activity 2.2.2.	Quantifying the baseline carbon footprint for seven (7) crops (rice, potato, sugarcane, panela cane, bananas, plantain, and livestock), fertilizer use and industrial processing in sugarcane cultivation.	SA1. Definition and/or installation of crop plots for measurements. SA2. Purchase, installation and calibration of equipment to measure GHG. SA3. Collection of information and recording of data on the measurement of GHG and other variables of interest. SA4. Quantification of GHG for different genetic materials, management technologies and techniques for the crops prioritized by the project. SA5. Compilation of complementary information. SA6. Quantification of the carbon footprint for different crops under different production models.	TIER 2 emission factors for conventional management technologies or techniques for eight (8) crops (rice, maize, potato, panela sugarcane, sugarcane, banana, plantain, coffee) and livestock production in 22 zones of the country. Carbon footprints calculated for conventional management technologies or techniques for seven (7) crops (rice, potato, panela sugarcane, sugarcane, banana, plantain) and livestock production.

<p>Activity 2.2.3.</p>	<p>Hydrological modeling of basins to identify water harvesting points in rice, panela cane, bananas, and coffee production systems .</p>	<p>SA1. Collect spatial and hydroclimatic information in the watershed. SA2. Construction and validation of the hydrological model and generation of scenarios of changes in coverage and climate forecasts. SA3. Mapping, identification and validation of water harvesting points. SA4. Generation of water conduction routes. SA5. Construction of water reservoirs (panela cane, plantain and coffee). SA6. Training workshops for practitioners of the sector. SA7. Efficient planning of water uses at the level of irrigation districts.</p>	<p>Implementation of planning models for water efficient use in four (4) water supply basins for four (4) crops (rice, panela sugarcane and banana).</p>
<p>Activity 2.2.4.</p>	<p>Evaluation of efficient water use practices in agronomic management and transformation processes (e.g., milling of panela cane) in potato, panela cane, plantain, banana, coffee crops and livestock .</p>	<p>SA1. Identifying and formulating agronomic management practices and industrial transformation. SA2. Selecting and implementing conventional productive plots with efficient use practices. SA3. Installing equipment to monitor moisture balance. SA4. Creating moisture balance and monitoring water quality. SA5. Quantifying the water footprint in conventional systems and efficient water use practices. SA6. Training workshops on monitoring and managing efficient water use systems.</p>	<p>Water consumption values measured for ten sustainable management technologies or techniques for five (5) crops (potato, panela, sugarcane, plantain, banana, coffee) and livestock production in sixteen (16) areas of the country. Evaluation of the performance of wastewater and sludge treatment systems in four (4) locations. Eight (8) water footprints calculated for eight (8) sustainable management technologies or techniques in four (4) crops (potato, panela sugarcane, plantain, banana) and livestock production in sixteen (16) locations.</p>
<p>Activity 2.2.5.</p>	<p>Evaluation of GHG emission mitigation practices in agronomic management and transformation processes in rice, maize, potato, panela cane, plantain, banana, coffee, sugarcane crops, and livestock .</p>	<p>SA1. Definition and/or installation of crop plots for measurements. SA2. Purchase, installation and calibration of equipment to measure GHG. SA3. Collection of information and recording of data on the measurement of GHG and other variables of interest. SA4. Quantification of GHG for different genetic materials, technologies and management techniques for the crops prioritized by the project. SA5. Collection of complementary information SA6. Quantification of the carbon footprint for different</p>	<p>TIER 2 emission factors for one hundred and fifteen (115) genetic materials, eighteen (18) management technologies or techniques for eight (8) crops (rice, maize, potato, panela sugarcane, sugarcane, banana, plantain, coffee) and livestock production, and six (6) cattle feed supplementation diets in 22 zones of the country. Fourteen (14) carbon footprints calculated for 10 sustainable crop management technologies or techniques in six (6) crops (rice, potato, panela sugarcane, sugarcane, banana, plantain) and livestock production.</p>

		crops under different production models.	
Activity 2.2.6.	Landscape restoration in sugarcane cultivation and livestock systems .	SA1. Identification of potential areas for intervention and landscape units. SA2. Implementation of a nursery for the propagation of native species. SA3. Land cover mapping SA4. Implementation	Sustainable livestock systems implemented in 3,840 ha in 16 areas of the country.
Activity 2.2.7.	Massive implementation of agronomic management technologies and transformation processes that enable more efficient use of water and promote low-carbon development in rice, maize, potato, sugarcane, plantain, banana, and livestock production.	SA1. Selection of beneficiary farms and lots. SA2. Training for producers. SA3. Implementation of sustainable production models in seven (7) crops prioritized by the project. SA4. Generating dissemination material. SA5. Implementing sustainable systems/practices at the regional level.	5,750 ha in sustainable production models for rice, maize, potato, panela sugarcane, banana and plantain to reduce GHG emissions and water consumption in 33 production areas of the country.
<b>Result 3.1. Improved business models that provide farmers with reasonable profits and improved GHG mitigation practices</b>			
Activity 3.1.1	Strengthen gremios capacities to use digitally enabled tools that improve the provision of services to farmers with emphasis on profitable production system that also reduce GHG emissions and increase climate-resilience	SA1. Assessment of gremios capabilities and needs, as well as, opportunities to better-inform their allocation of resources (human, financial) to respond to farmers demands and help them to manage climate to their advantage. SA2. Co-design of implementation plans for gremios to the decision-making processes to cost-effectively enhance their provision of climate-related services to farmers. SA3. Co-develop feedback loop mechanisms to provide information to the gremios to inform allocation of resources/efforts (human, financial) for climate-related services provision to farmers.	Eight (8) gremios strengthened in the decision-making processes
Activity 3.1.2	Implement inclusive climate-resilient and low-carbon business models for agricultural products and services .	SA1. Systematization of the results generated by the components of the project on digital agriculture, climate-smart and low-carbon practices to guide its inclusion into business models. SA2. Coordinate producers, gremios, buyers and other actors in the value chains, to prioritize opportunities for improvement, as well as barriers that limit the escalation of climate	Eight (8) strategies for scaling up climate resilience and GHG emission reduction practices for selected value chains.  Eight (8) business models with a focus on adaptation and GHG emissions reduction (designed, implemented and evaluated)

		<p>resilience and low emission practices.</p> <p>SA3. Design of an escalation strategy (with gremios, producers and other actors) that allows the integration of digital agriculture elements and climate services to the value chains, to increase climate resilience and mitigate GHG emissions.</p> <p>SA4. Implement business models for producers and buyers, to enhance climate mitigation practices and evaluate market opportunities for differential products.</p> <p>SA5. Evaluate changes in the business models of producers and buyers, and identify lessons learned and success factors in scaling up digital agriculture mechanisms and low-carbon practices in the value chains.</p>	
Activity 3.1.3.	Enhance financial sector engagement with farmers and their needs and efforts on climate-resilience and climate mitigation activities	<p>SA 1. Implementation of a capacity building program to raise awareness of financial sector institutions (banks, MFIs, financial cooperatives, insurance companies, etc.) on mid and long-term de-risking mechanisms that the project will implement throughout its components (e.g., DCIPs, climate-smart practices and technologies).</p> <p>SA2. Facilitate participation and involvement of financial institutions in the MTAs for accessing local and tailored information on climate-smart actions implemented by the agricultural sector to reduce climate risks, which will reduce uncertainty and may incentivize the design of tailored financial products for the agricultural sector.</p> <p>SA3. Identify opportunities with financial institutions and prioritize cases studies to provide technical support for incorporating climate-resilient and low-carbon criteria to their agricultural financial products in compliance with the environmental, social, and governance (ESG) criteria.</p>	Evidence of at least four (4) financial institutions that participate in MTAs and use information provided by the project to inform their businesses contributing to wide implementation of climate-resilient and low-carbon options in agricultural sector.
Activity 3.1.4.	Fostering agri-digital entrepreneurship ecosystems	SA1. explore and identify potential opportunities for new ventures.	A new venture identified and created based on new digital technologies.

		SA2 support creation of new ventures and transforming existing businesses by developing new digital technologies.	
<b>Result 3.2. Modernized technical assistance and agricultural extension services with multi-tool strategies, differentiated and adapted to specific environmental, social, gender and productive contexts at the national level</b>			
Activity 3.2.1	Foster inclusion of two-way digitally enabled tools for enhancing models for technology transfer technical assistance within an innovations system approach	SA1. Linking plans directed by Agrosavia, for Musaceae , potato and panela sugarcane; HUB innovation model applied by CIMMYT for maize; Knowledge Management Model in Sustainable Livestock by Fedegan; Dissemination campaigns of the National Extension Service of the National Federation of Coffee Growers; AMTEC mass adoption model in rice; The technical cooperation and technology transfer service (SCTT) with the network of Technology Transfer Groups (GTT) in sugarcane; Rural School Methodology (ECAS) by Asohofrucol – Musaseas. SA2. Exchange of experiences. SA3. Use of voice (IVR) and text (SMS) messaging, WhatsApp networks and chatbot. SA4 Gremios digitally enabled platforms or available mobile applications.	54,000 producers strengthened in the implementation of resilient and low-carbon technologies.
Activity 3.2.2	Capability development on innovation systems approach and its inclusion into updated technology transfer plans	SA1. Carry out events to disseminate the project and its content. SA2. General training sessions by Result. SA3. Work meetings. SA4. Development of written material, in physical and digital form. SA5. Development of videos with the project topics. SA6. Follow-up and joint work with the Agroclimatic Technical Committees.	30 awareness materials (booklets, brochures, flyers, factsheets, videos, etc.) to support training (standardized in language and concepts) for different types of audiences with 6,000 pieces (copies).
Activity 3.2.3	Strengthen gremios and farmers capacities on climate adaptation and mitigation and nurture knowledge exchanges across farmers groups.	SA1. Conduct topic-specific workshops. SA2. Hold operation planning meetings. SA3. Dedicate working sessions for co-creation of procedures, implementation of experiments, analysis of results.	4,400 technicians strengthened in capacities on implementation of climate change adaptation and mitigation actions.  3 communities of practice created and in operation.

		SA4. Communities of practice on Digital Agriculture and Data Analysis, Generation of climate forecasts, and Communication and outreach; SA5. Conduct open training courses on specific topics on virtual education platforms; SA6. Strengthening of academic programs, graduate theses and internships.	
Activity 3.2.4	Develop a strategy that allows dissemination, access and use of project results by key public and private stakeholders	SA1. Management meetings with national institutions. SA2. Executive reports to producer associations on progress and needs towards sustainability of services. SA3. Communication through traditional and digital media, social media channels, project website. SA4. Development of infographics (Project identity).	Sixty (60) entities of the agricultural sector strengthened in climate change adaptation and mitigation actions.

**E.7. Monitoring, reporting and evaluation arrangements (max. 500 words, approximately 1 page)**

134. **Monitoring and evaluation system.** The monitoring and evaluation of the impact of the CSICAP Project will consider the different levels (producer, farmer associations and other relevant actors) that will be participating in the interventions. The Impact and Results indicators proposed by the GCF will be taken as a basis, however, some specific indicators by farmer associations will also be added. To carry out the implementation of the Monitoring system, a joint work of the teams of the different institutions involved will be coordinated. In this way, the system will be implemented by the CIAT Bioversity Alliance, led by the Prospects, Applied Economics and Impact team (FAE4Impact) in coordination with Agrosavia. This group will be in charge of collecting information from different sources and conducting periodic monitoring analyzes. In methodological terms, the appropriate methods will be applied for this type of intervention, such as differences in differences, matching and instrumental variables, complemented with qualitative analyzes. In the first phase, a baseline will be designed and built, taking advantage of databases already built or new data will be collected depending on their availability. In the last year, the final line will be developed so that the final impact of the Project can be measured.
135. In the technologies / alternatives that seek an efficient use of water resources and low carbon (emission reduction and carbon capture), the water footprint and the carbon footprint of the proposed systems will be measured versus the conventional systems used by the producers, comparing also productivity and costs of both systems so that the comparative advantages of the proposed system can be demonstrated. The recommendation domains of each alternative will be analyzed and based on this, a network of demonstration farms will be designed and implemented that will allow the creation of technology transfer nodes and offer technical support to producers who adopt the technology.
136. **Monitoring by CAF.** The CAF will carry out administrative missions or inspection visits, depending on the importance and complexity of the project execution, according to the monitoring plan developed each year by the CAF project team. In addition to the field visits, biannual meetings will be held in conjunction with the Executing Unit and the CAF to discuss, update and review the progress of the Project management tools, among other aspects, such as: i) progress of the identified activities in the annual plan of activities; ii) level of compliance with the indicators established in the Monitoring Plan for each component; (iii) Annual Operations Plan for the following year and updating of the Project Execution Plan; (iv) Procurement Plan for the next 12 months; (v) financial progress; (vi) update of the Risk Matrix; and (vii) possible modifications to the budget allocations by component. The Executing Unit undertakes to maintain a Monitoring and Evaluation System for each component, the basis of which will be used to develop the reports and data submitted to the CAF. These aspects will be presented at the portfolio review meetings that CAF organizes every six months.
137. **Reports.** During project implementation, the monitoring strategy will be applied with the following reporting system:
138. **Semiannual reports.** The semi-annual reports will allow feedback on the different activities and make corrections if necessary while the project is in progress. These reports will be made with the information collected from the sources mentioned above and with a guide of indicators already established. These reports will have a

specific template and will be concise in the information of interest. The reports will be presented to the MADR, CAF and GCF. These monitoring reports must specify:

- The progress of the activities carried out compared to those programmed in the work plan for that period, indicating the achievements of the products.
- Presentation of the difficulties (if any) of the implementation process of the activities, especially of a technical nature, explaining the justification for these difficulties.
- Recommendations for solutions to the difficulties that were identified in the structure that manages the project and how the global agenda would be adjusted.
- Next steps and expectations for the next semester.

139. **Annual Reports.** These reports will be accompanied by semi-annual monitoring, these will be more of an evaluation of the activities that were carried out in the year and are complemented with other indicators more aimed at results. In addition, it will express the lessons learned from the year based on the monitoring and activities that each component highlights as achievements during that period, being a document of great help in decision-making.

140. **Final Report.** At the end of the project, a report will be developed that includes the results achieved versus those planned by crops and disaggregated by gender where appropriate.

141. **Evaluation.** An evaluation is planned at the end of the project to measure the final results of the main indicators defined. It is proposed to carry out the evaluation at three levels: i) micro or household level (producers and their household); ii) at the meso or organizational level with a focus on farmer associations; and, iii) at the macro level, in terms of influence on policies related to climate change.

## F. RISK ASSESSMENT AND MANAGEMENT

### F.1. Risk factors and mitigations measures (max. 3 pages)

#### Selected Risk Factor 1

Category	Probability	Impact
Technical and operational	Medium	Medium

#### Description

Stakeholder risk: In general, the community of farmers and ranchers tends to be very conservative when adapting to new technologies, varieties or crops, presenting a very important but passive resistance to the introduction of new profitable procedures or systems.

#### Mitigation Measure(s)

This risk can be mitigated by establishing close relationships with relevant stakeholders, including the Government and stakeholders at the end of the production chain. These measures decrease the probability that the risk will occur, to a lower level.

#### Selected Risk Factor 2

Category	Probability	Impact
Technical and operational	Low	Medium

#### Description

Technical performance risk: This risk is related to possible incorrect design or management of trials and pilot projects, or failures in partnership agreements or institutional settings. The probability of these risks occurring is very low despite the high level of impact they represent.

#### Mitigation Measure(s)

To mitigate this risk, CIAT will establish a Project Coordination Team with the capacity to travel to monitor progress and detect mismanagement and non-compliance risks early, and take action on time.

#### Selected Risk Factor 3

Category	Probability	Impact
Technical and operational	Medium	Medium

#### Description

Risk of delay and cancellation of costs: There is an inherent risk of delay in planned scheduled works, including the acquisition of inputs, human resources, materials and tools. This risk is likely to occur with a medium impact. In the event of a time delay, a possible result is increased costs.

#### Mitigation Measure(s)

Contingencies should be included in the project's budget estimates, as a mitigation measure for this risk. Another measure is a close budgetary and financial monitoring to avoid possible delays or cancellations. A CIAT coordinator will be in charge of the operational aspects to detect early risks and act on time.

#### Selected Risk Factor 4

Category	Probability	Impact
Governance	Medium	Medium

#### Description

Sustainability risk: The lack of governance or mechanisms that limit the sustainability of the project is a risk of medium probability and high impact.

Mitigation Measure(s)

From the beginning of the project, each actor will have clear responsibilities assigned during the execution period, as well as after the project ends, and will be assumed by the farmers themselves. Strengthening producer associations will help mitigate this risk as they will provide technical and financial support to their members. Once the project is completed, maintenance and operation plans will be established to provide adequate maintenance to the infrastructure and guarantee a long useful life.

**Selected Risk Factor 5**

Category	Probability	Impact
Technical and operational	Low	Medium

Description

Location risk: the project will carry out activities in remote areas with difficult access, which represents a risk for the execution of the project in terms of delays and costs.

Mitigation Measure(s)

To mitigate the risk, the location will be a criterion for the selection of pilots, and those closest to the logistics structure will be preferred. CIAT will have the capacity to provide supervision at all implementation sites, with regular visits and reports.

**Selected Risk Factor 6**

Category	Probability	Impact
Forex	Medium	Medium

Description

Foreign exchange risk: financial planning can be affected by currency fluctuations in the future.

Mitigation Measure(s)

Coverage and good planning can help mitigate this risk. This would not change the probability, but it would mitigate the impact that the exchange rate may have on project costs.

**Selected Risk Factor 7**

Category	Probability	Impact
ML/FT	Low	High

Description

Probability and impact for money laundering, terrorist financing and prohibited practices risks.

Mitigation Measure(s)

CAF has established an AML program, customer screening, monitoring and related due diligence procedures that are designed to prevent doing business with entities and/or persons that engage in illegal activities, sanctions screening which includes lists of sanctions and restricted persons issued by countries or by international organizations (UE, UN, US- OFAC, UK, France, Canada, World Bank, Inter-American Development Bank, and a designated Compliance Officer.

The contract (legal agreement) signed among CAF and executive agency and other relevant parties, there are obligations to comply with AML and FT regulations and to prevent prohibited practices. Additionally, the business manager performs due diligence through the AMLCFT risk profile and KYC checklist. They also carry out the screening of the MHCP, MADR and related parties against the international sanctions lists. The information is updated according to the risk profile, once a year for low-risk clients and twice a year for medium risk.

**Selected Risk Factor 8**

Category	Probability	Impact
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Other	Medium	Medium
Description		
Volatility of agricultural commodities prices.		
Mitigation Measure(s)		
As part of its implementation, the CSICAP project will contribute to the reduction of crop price volatility, often associated with climatic events, with the improved information from big data, agroclimatic services, and improved crop management, which will allow farmers to improve decision making, lowering uncertainty and better coupling production with markets to reduce crop price variation. Regarding the prices of the supplies, in the event of a high increase of the prices of them, it is possible to reach an agreement with the producers' association (which are strategic partners of the project) who usually have stock and the quantity required by the project is quite small.		
<b>Selected Risk Factor 9</b>		
Category	Probability	Impact
Technical and operational	Low	Medium
Description		
The ability to find suitable contractors to undertake the work at the expected pricepoint.		
Mitigation Measure(s)		
There is a pool of human talent that has worked in previous/similar experiences as the CSICAP project in Colombia so the risk to find suitable contractors to undertake the work at the expected price point is low. The risk will be mitigated by using this pool of human talent, as well as pursuing new talent from qualified rosters of candidates that can meet the minimum experience and the expected price point. Additional mitigation measure considered was during the formulation process of the project because the producers' associations were active actors and they will be strategic partners for the implementation, so their human talent skills have been considered in the whole process.		
<b>Selected Risk Factor 10</b>		
Category	Probability	Impact
Technical and operational	Low	High
Description		
Vertical dissemination to farmers of the technologies and good practices under components 1 and 2.		
Mitigation Measure(s)		
During the formulation process of the CSICAP project with the farmers associations (gremios) and the MADR, it During the formulation process of the CSICAP project with the farmers associations (gremios) and the MADR, the transfer of technology and its dissemination has been included as a key aspect in each component of the project considering the lessons learned from the pilot. As a result, there are dissemination and training activities with the technicians and with farmers in each component to strengthen the adoption of the technologies and its use by farmers. In addition, there will be signed agreements between Gremios – Farmers/ producers based on previous experiences of projects between MADR-CIAT-Gremios that involve technology transfer to producers. These agreements will include three main sections: (i) protocol for technology delivery, control, and follow-up; (ii) guideline for the implementation and use of the technology and; (iii) certificate of Delivery which will be signed by the producer and gremio including a photographic record.		

## G. GCF POLICIES AND STANDARDS

### G.1. Environmental and social risk assessment (max. 750 words, approximately 1.5 pages)

*Provide the environmental and social risk category*

142. **Environmental and Social risk category.** Taking into account the CAF safeguards evaluation exercise and the guidelines established by the GCF, this Project has been classified in Category B, that is, it presents moderate environmental and social impacts in the project's intervention areas. The project will specifically intervene in areas where prioritized production chains are already established and seeks to reduce their impact on natural resources through the implementation of good agricultural practices such as reducing the water and carbon footprint, as well as reducing GHG emissions through the implementation of new technologies that allow adaptation to climatic conditions and benefit producers. The identification of environmental and social risks was carried out in which it is evidenced that the possible impacts of the implementation of the project are reversible and can be controlled through the proposed mitigation measures, especially in relation to the inclusion of women in the activities and benefits of the project, the production of new varieties of plants resistant to climate variability, and the production systems that currently exist in paramo areas, among others.
143. **Environmental and Social Management Framework.** An environmental and social assessment (ESA) was developed and included in the Environmental and Social Management Framework (ESMF) that was also prepared for CSICAP, in line with the requirements demanded by the GCF for a project Category B. In paramo ecosystems, according to the guidelines of this law, it is important that CSICAP strengthen initiatives for agricultural reconversion, especially when it comes to livestock activities, as well as measures to reduce the use of agrochemicals. In addition, it is of great relevance for the Project and the agricultural sector to promote spaces for participation and discussion in which the existing challenges are addressed in the implementation of agricultural practices in moorland ecosystems. The CSICAP Project has much to contribute in these aspects, including supporting the national government, especially the MADR, to promote, document and implement sustainable production practices with low environmental and social impact. Regarding the use of agrochemicals, it is suggested that the farmer associations review the existing protocols, in order to promote greater adoption of good practices by producers, in such a way that not only environmental but also environmental risks can be reduced. in human health.
144. The social analysis showed that most of the producers in the chains and territories prioritized by the project are older than 60 years of age. This imposes challenges, not only in terms of generational change with greater youth participation, but also in relation to the promotion of change, the adoption of knowledge and new technologies, and the communication and implementation methods used. In addition, peasant producers and those belonging to ethnic groups currently implement production and conservation practices that have cultural roots, several of which must be recognized and incorporated into the Project in order to generate trust and at the same time promote appropriation and construction. social knowledge. Added to the above is the low digital connectivity of the territories participating in the Project and the fact that the changes entail economic risks that can be difficult for small producers to manage. These and other factors put at risk the adoption by the beneficiaries of the knowledge, technology, practices and models that are expected to be disseminated through CSICAP.
145. Given this scenario, the ESMF recommends, among other aspects, a more participatory approach, in which a strategy for the social appropriation of knowledge and a communications plan are formulated. This approach must respond, in a differentiated way, to the specific characteristics of the producers of each production chain and the conditions of the territories, and must recognize and incorporate traditional and local knowledge and practices, using an inclusive and easily understood language.
146. In summary, the ESMF established, among others, the development of the following plans and strategies:
- Risk management plan associated with security issues.
  - Strategy for the social appropriation of knowledge.
  - Communications plan.
  - Risk management plan for natural disasters and environmental emergencies.
  - Comprehensive solid waste management plan and development and implementation of roadmaps.
  - Environmental plans that incorporate matters related to Payments for Environmental Services, restoration, landscape management tools, conservation agreements, among others.
  - Updating of occupational health and safety plans, measures and protocols related to the use of pesticides and agrochemicals.
  - Educación económica y financiera para pequeños productores/as agropecuarios.
147. Regarding the administration of the ESMF, it was defined that the Project Management Unit will be the maximum responsible for the ESMF of CSICAP, and its fulfillment and implementation will be through CIAT, the farmer associations, Agrosavia and other entities that carry out project activities. The Unit will have an Environmental, Social and Gender Support Team, which will respond to the directives of the General Director of the project who will be its leader. The Project Management Unit, through the Environmental, Social and Gender Team, will provide guidelines and technical advice for compliance with the ESMF. The Environmental, Social and

Gender Team will be in charge of designing ESMF guidelines, plans and strategies, providing support during implementation, monitoring progress and compliance as stipulated in ESMF, and supporting the revision and updating of ESMF. In addition, if is required, it is possible for the stakeholder's access to the GCF's Independent Redress Mechanism (IRM).

148. Finally, action, product and result indicators were established to monitor and follow up on the ESMF (including the Gender Action Plan (GAP)). The action period of each activity was defined (before, during and after implementation). Those responsible for compliance and monitoring of each action were established (MADR, CAF, CIAT, farmer associations, extensionists). The methods and reporting periods for monitoring and reporting (annual, monthly, as required) were also defined.
149. **Capacity of the procured parties to implement the ESMP.** In summary, two groups of farmer associations are evident: The first group has a medium capacity (they require formulating or updating the entity's environmental management plans, strengthening its information systems and monitoring of affiliates and environmental issues, improving the accompaniment of producers / thus, develop protocols for the attention of complaints and claims, seek greater approaches with the environmental authorities) and is integrated by Fedepapa, Fenalce and Fedepanela. The second group is made up of farmer associations with a high capacity (they have developed the above measures but require reviewing specific aspects of them) for environmental and social management: Asbama, Asocaña, Fedearroz, the National Federation of Coffee Growers and Fedegan. However, it is important to point out that the capacities are not homogeneous within these associations. For this reason, the ESMF defined that each farmer association must develop a plan to strengthen their capacities for environmental, social and gender management, which responds to their current status.
150. **Project-level grievance redress mechanism.** For the registration and reporting of Petitions, Complaints, Claims, Suggestions and Denunciations (PCCSD), the following measures are considered:
- Online platform: The ESMP includes the design and operation of an online platform for the project, which will include a section for registering the PCCSD that may be submitted. Users will be able to directly submit the PCCSD for attention by project staff.
  - Document management: Each PCCSD will have a file number. The PCCSD can also be carried out directly through field personnel or through calls, physical mail, etc. The person in charge of document management of the ESMP team will register in the system.
  - Response and follow-up: The communication will be forwarded in a timely manner to the competent authority for processing and response. In the case of communications and PCCSD referred by women and ethnic groups, special attention will be paid. Periodic reports will be made on the main PCCSDs that are presented.
151. The PCCSD Resolution Mechanism includes a classification of the complaint, according to its level of urgency, giving priority to the attention of complaints and claims that put the life and health of the most vulnerable population at risk. According to the classification, the official/contractor who has the competence to attend to it will be reported immediately, who will identify the measures and corrective actions to address the situation. Subsequently, a formal response to the claim will be given, specifying the actions and the person / s responsible for carrying them out. The maximum response times to the PCCSD will be 15 business days after receipt. If necessary, roundtables will be convened. Each PCCSD will be followed up and formally closed.
152. Regarding stakeholder participation, 52 interviews and group sessions were carried out. Taking into account that the project is still in the structuring stage and that at the time of the consultations the formulation of the components and activities was still in the process of technical discussion, during the interviews a general description of CSICAP was made and subsequently inquired about the main strengths, possible obstacles and opportunities of the project, as well as recommendations for socializing the project information and for efficient communication between actors, and to guarantee success in the inclusion of a gender approach and environmental management strategies in the project, among other aspects.
153. To maintain interaction with the different stakeholders during project implementation, a stakeholder participation plan was formulated, which includes:
- Start-up workshop.
  - Strategies in the GAP and ESMF that include participatory exercises (strategy of social appropriation of knowledge, work tables and spaces for discussion and collective construction of knowledge with producers, participatory work sessions with women) and interaction with interested parties (Communications Plan, project web platform, biannual socialization events).
  - Complementary measures: definition of criteria for the selection of beneficiaries, celebration of initiation acts with rights and commitments of the beneficiaries, participation of beneficiaries in decision-making bodies of the project, management of alliances with strategic actors.
154. **Potential impacts on indigenous populations.** The CSICAP project will not have a direct impact on collective territories (indigenous reservations and community councils), therefore it is not considered necessary to carry out prior consultation processes. However, with the aim of promoting the participation of ethnic producers in the project, the ethnic differential approach was included in the diagnosis and analysis of risks, as well as in the mitigation

measures and in the dissemination and relationship processes that the Project will implement. CSICAP. Specifically, it is considered pertinent to take the following provisions:

- Within the framework of the strategy for the social appropriation of knowledge and the communications plan, recommendations will be incorporated to promote the participation of producers belonging to ethnic communities in the agricultural value chains analyzed.
- Include in the technical team of the project, especially in the group of extension workers, people belonging to ethnic communities in the project intervention areas, in such a way that trust is generated, work with the communities is facilitated at the same time local capacity.
- In the chains that apply, it is recommended to propose a minimum participation percentage of producers belonging to ethnic communities in the project.
- Incorporate the identification of producers who belong to ethnic communities in the information collection formats and in the farmer associations' databases.
- An orientation guide will be formulated with guidelines to advance in the incorporation of the differential approach in the internal policies and guidelines of the farmer associations that participate in the project.

**G.2. Gender assessment and action plan (max. 500 words, approximately 1 page)**

155. **Development of the Gender Analysis and Gender Action Plan.** The Gender Analysis carried out a comprehensive diagnosis with a gender perspective of the territories, the population and the agricultural value chains that are the focus of the CSICAP project, as well as the institutional, normative and policy framework associated with gender equality. The Gender Analysis was obtained from mixed research methods and the triangulation of secondary and statistical information (population census, agricultural census, and quality of life, labor market and time use surveys), with primary information. The latter included the completion by the farmer associations of an institutional capacity analysis form, as well as the development of interviews and group sessions with farmer associations officials, extension workers, producers and affiliated producers (including people belonging to ethnic groups) and actors. institutional institutions of the national and local order.
156. For the formulation of the Gender Action Plan, the gender approach was analyzed and mainstreamed in each of the components, axes and activities that comprise the CSICAP project. Based on the results of the Gender Analysis, the risks associated with gender were identified and, on the one hand, mitigation measures were formulated so that CSICAP does not widen the gender gaps, and, on the other hand, measures to promote gender equality in order for the project to contribute to reducing these gaps.
157. **Summary of Gender Analysis.** The Gender Analysis identified that the gender division of work persists mainly in rural contexts; Consequently, housework and unpaid care work are activities that fall on rural women, which considerably limits their labor participation and permanence in the paid labor market and decision-making in relation to agricultural production units (UPA)<sup>34</sup>. Additionally, women farmers and ranchers have less access to productive factors, such as land, credit and technology, which reduces their production potential in crop chains, and limits local economic development.
158. In response, the Gender Action Plan of the CSICAP Project seeks to reduce the barriers faced by women producers who participate in the Project and will take advantage of it to identify opportunities, in an articulated manner between different actors, to favor a greater participation of rural women in the local productive development. In relation to the care economy<sup>35</sup> and women's rights, actions will be developed based on the 3R concept: i) Recognition through the sensitization of the different actors involved in CSICAP (farmer associations officials, extension workers) , ii) Reduction of the time that women dedicate to these activities, facilitating access to care services (promotion of pilot of nurseries, community washing machines, efficient stoves, among others) and iii) Redistribution of loads in the home (training to producers and agency promotion, participation and empowerment of women). In a complementary way, and to improve access to technology, technical assistance alternatives that favor women will be promoted (flexible hours, comprehensive assistance, "producer to producer" methodology, access to technologies that reduce their workload, but increase productivity, among others).
159. Likewise, a greater participation of women in the Project will be fostered, by taking advantage of economic opportunities along the links of the productive chains (for example, through the economic exploitation, by women, of species for the models). silvopastoral and agroforestry, which in turn can improve household food security). Similarly, the institutional capacities of the farmer associations will be strengthened to promote gender equality from their mission, so that in this way they can have the necessary tools to implement the action plan.
160. **Consultations with interested parties.** 52 interviews and group sessions were carried out, in which 205 people participated: 131 men and 74 women, who were asked for recommendations to ensure success in including the gender approach in the project, among other aspects. The actors recommended characterizing the women beneficiaries to develop actions relevant to their needs, include affirmative measures, sensitize all actors on gender issues, promote activities exclusively for women and / or that are led by women, promote associativity and participation of women. These suggestions were incorporated into the actions proposed in the GAP, several of which include participatory formulation processes (in field workshops) with women, in order for the project to have a "bottom-up" approach. Additionally, several of the actions will be implemented not only with the direct beneficiaries (women producers), but also with indirect ones (for example, from the households of the producers) in order to promote a greater participation of rural women in the project.
161. The Project Management Unit will have a Gender Team, made up of a senior and a junior professional, who will be in charge of the design of guidelines, plans and strategies of the GAP, provide support and technical advice during implementation, monitor the progress and compliance as stipulated in the GAP, and support the review and update of the plan.

### G.3. Financial management and procurement (max. 500 words, approximately 1 page)

<sup>34</sup> In CSICAP municipalities, on average, men make production decisions in 58.4% of UPAs, compared to 20.0% of UPAs where women make decisions, and 15.3% where decisions are made in a shared way.

<sup>35</sup> Article 2 of Law 1413 of 2010, defines the care economy as "unpaid work carried out in the home, related to the maintenance of the home, the care of other people in the home or the community and the maintenance of strength of paid work. " In the case of rural women, the effects of climate change are exacerbated by gender norms and relations in the home and on the farm. The overload of unpaid domestic and care work, as well as low participation in production decision-making, low access and control over land and financial and technological resources, and low income and high levels of poverty (especially in female heads of household), among other factors, limit the ability of women to develop adaptation strategies to climate variability. In addition, the effects on household food security can be deepened, because, on the one hand, the responsibility for the supply of food falls on them, and, on the other hand, climate change can reduce the availability of water, food and resources for self-consumption.

162. **Financial Management and Control.** The MADR, as Executing Entity, will be responsible for supervising the implementation and supervision of the project, in accordance with its own internal rules, policies and procedures, including the administration and management of the use of GCF resources, as well as the follow-up, evaluation and reporting responsibilities. The loan resources will be administered according to the CAF Credit Process Manual (MN / DCRR -017) that has been reviewed by the GCF during the CAF accreditation process. The Manual guides the process for all phases of credit, including: (i) Origination; (ii) Evaluation; (iii) Approval; (iv) Formalization; and (v) Administration. The non-reimbursable resources of the GCF will be executed by the Government of Colombia, through MADR as the Executing Agency, and CIAT, as the procured party. The Figure in this section shows the execution scheme of the GCF funds and how these would be handled by CAF as an accredited agency.

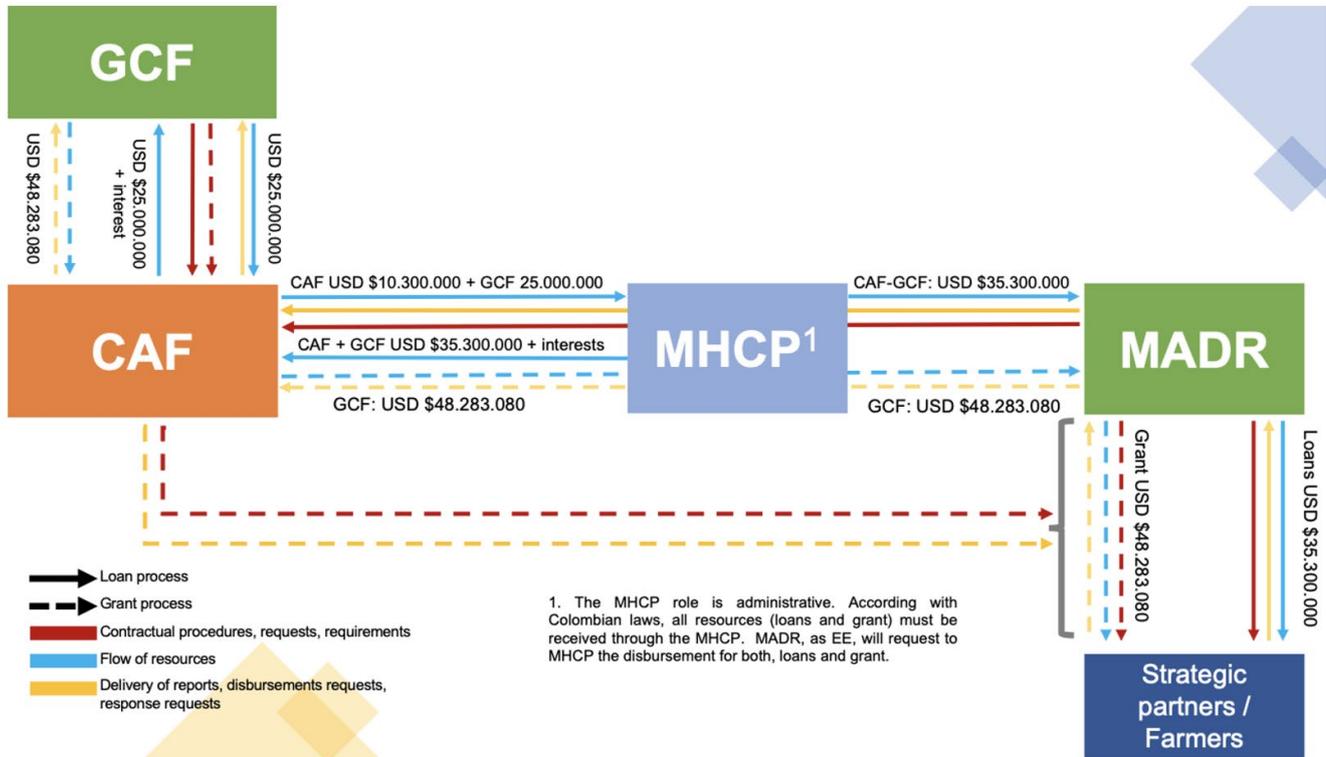


Figure G.3.1. Flow chart, management and financial control of the Project

163. The financial control and procurement processes will be implemented in accordance with the rules and regulations of the CAF, which were certified in the accreditation process before the GCF. On the other hand, CIAT has an ERP UBW (Unit4 Business World) that allows it to separate projects through specific codes per signed agreement and monitor budget execution online, it also has logistics and travel modules that allow requests to be made to assistants and project leaders directly giving transparency to the execution of expenses through their approval workflows. CIAT handles the accrual accounting established in the procedures documented in Directive D 2.15. The Alliance has an annual financial institutional review and audit process, through the External Auditors, the CGIAR internal audit and, on occasions, if the donor requires it, the audit of specific projects that is carried out by external auditors and negotiated as part of the audit plan in accordance with the requirements established in the signed agreements and with the budget availability within the agreement.

164. During project execution, CAF will supervise and guarantee quality in accordance with its policies and procedures. This may include follow-up missions, spot checks, and participation in Steering Committee meetings. The project will be subject to the CAF audit regime, including external and internal audit functions. CIAT is responsible for financial monitoring and has the support of a financial management team, which will interact with and support the work of the Executing Unit.

165. **Procurement.** The Procurement Plan is aligned with that of CAF's Goods and Services Procurement Manual, following what is stipulated in CAF's Master Accreditation Agreement (AMA) with the GCF. Similarly, the financial management policies of CIAT (the procured party) are aligned with those of CAF to guarantee sound internal control. Procurement processes will follow CIAT's Procurement Manual for Goods, Consulting Services and Works, with the thresholds for procurement. CIAT guidelines will be used for the acquisition and contracting of goods. These guidelines have been included in Annex 10.

166. The Alliance of Bioversity International and CIAT has implemented an ERP (Agresso Unit4 Business World), which manages the procurement of goods and services. Its use improves the flow of information, supports the traceability of processes, facilitates reporting, increases transparency and strengthens internal control. Acquisitions comply with the Logistics Policy, which is based on principles of fairness and competitiveness, transparency, quality, service, objective selection and reduction of legal risk. In addition, the guidelines set forth in the CGIAR Financial Guidelines Series (FG6) IFRS have been adapted to the procedures of the Alliance.

167. Due to the civil nature of the relationship with suppliers, they are required to assume all material, human and financial risks involved in acquisitions, thus avoiding risks to the Alliance. Therefore, in accordance with the nature, scope and purpose of the contracted good or service, contracts are signed in which providers are suggested to acquire the policies with the insurance broker of the Large Beneficiaries Program. Finally, in the contracts there are compromissory clauses are considered for the solution of differences, controversies or discrepancies that arise between the parties.

#### G.4. Disclosure of funding proposal

No confidential information: The accredited entity confirms that the funding proposal, including its annexes, may be disclosed in full by the GCF, as no information is being provided in confidence.

With confidential information: The accredited entity declares that the funding proposal, including its annexes, may not be disclosed in full by the GCF, as certain information is being provided in confidence. Accordingly, the accredited entity is providing to the Secretariat the following two copies of the funding proposal, including all annexes:

- full copy for internal use of the GCF in which the confidential portions are marked accordingly, together with an explanatory note regarding the said portions and the corresponding reason for confidentiality under the accredited entity's disclosure policy, and
- redacted copy for disclosure on the GCF website.

The funding proposal can only be processed upon receipt of the two copies above, if containing confidential information.

## H. ANNEXES

### H.1. Mandatory annexes

- Annex 1 NDA no-objection letter(s) ([template provided](#))
- Annex 2 Feasibility study - and a market study, if applicable
- Annex 3 Economic and/or financial analyses in spreadsheet format
- Annex 4 Detailed budget plan ([template provided](#))
- Annex 5 Implementation timetable including key project/programme milestones ([template provided](#))
- Annex 6 E&S document corresponding to the E&S category (A, B or C; or I1, I2 or I3):  
  - Environmental and Social Impact Assessment (ESIA) or
  - Environmental and Social Management Plan (ESMP) or
  - Environmental and Social Management System (ESMS)
  - Others (please specify – e.g. Resettlement Action Plan, Resettlement Policy Framework, Indigenous People's Plan, Land Acquisition Plan, etc.)
- Annex 7 Summary of consultations and stakeholder engagement plan
- Annex 8 Gender assessment and project/programme-level action plan ([template provided](#))
- Annex 9 Legal due diligence (regulation, taxation and insurance)
- Annex 10 Procurement plan ([template provided](#))
- Annex 11 Monitoring and evaluation plan ([template provided](#))
- Annex 12 AE fee request ([template provided](#))
- Annex 13 Co-financing commitment letter, if applicable ([template provided](#))
- Annex 14 Term sheet including a detailed disbursement schedule and, if applicable, repayment schedule

### H.2. Other annexes as applicable

- Annex 15 Evidence of internal approval ([template provided](#))
- Annex 16 Map(s) indicating the location of proposed interventions
- Annex 17 Multi-country project/programme information ([template provided](#))
- Annex 18 Appraisal, due diligence or evaluation report for proposals based on up-scaling or replicating a pilot project
- Annex 19 Procedures for controlling procurement by third parties or executing entities undertaking projects financed by the entity
- Annex 20 First level AML/CFT (KYC) assessment
- Annex 21 Operations manual (Operations and maintenance)
- Annex 22 GHG Emissions Reduction Estimates
- Annex 23 Other relevant reference: impact assessment baseline initiatives (evaluation ex-post)
- Annex 24 Other relevant reference: estimation of direct and indirect beneficiaries
- Annex 25 Operations and maintenance (O&M) plan
- Annex 26 Annexes requested by iTAP

*\* Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*

**No-objection letter issued by the national designated authority(ies) or focal point(s)**



Bogotá D.C., jueves, 13 de mayo de 2021

DADS



Al responder cite este Nro.  
20214500488431

**THE GREEN CLIMATE FUND – GCF**

Att. [executive-office@gcfund.org](mailto:executive-office@gcfund.org)

Subject: Funding proposal for the GCF submitted by Corporación Andina de Fomento (CAF)  
– regarding Climate-smart initiatives for climate change adaptation and sustainability in prioritized agricultural production systems in Colombia (CSICAP).

Dear Madam, Sir,

We refer to the project titled *–Climate-smart initiatives for climate change adaptation and sustainability in prioritized agricultural production systems in Colombia (CSICAP) –* in Colombia as included in the funding proposal submitted by Corporación Andina de Fomento (CAF) to us on April the 30th 2021.

The undersigned is the duly authorized representative of the National Planning Department of Colombia.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the project as included in the funding proposal.

By communicating our no-objection, it is implied that:

- (a) The government of Colombia has no-objection to the project as included in the funding proposal;
- (b) The project as included in the funding proposal is in conformity with the national priorities, strategies and plans of Colombia;
- (c) In accordance with the GCF's environmental and social safeguards, the project as included in the funding proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the project as included in the funding proposal has been duly followed.





**El futuro  
es de todos**

**DNP  
Departamento  
Nacional de Planeación**

We acknowledge that this letter will be made publicly available on the GCF website.

Best Regards,

**SANTIAGO APARICIO VELÁSQUEZ**  
Director of Environment and Sustainable Development  
National Planning Department

[CC cpolycam@ocfund.org](mailto:CC_cpolycam@ocfund.org); [angelo.quintero@minagricultura.gov.co](mailto:angelo.quintero@minagricultura.gov.co); [thenao@dnp.gov.co](mailto:thenao@dnp.gov.co);  
[nelson.lozano@minagricultura.gov.co](mailto:nelson.lozano@minagricultura.gov.co); [l.tapasco@cqlar.org](mailto:l.tapasco@cqlar.org); [l.restrepo@cqlar.org](mailto:l.restrepo@cqlar.org); [rcasas@caf.com](mailto:rcasas@caf.com); [adelacruz@caf.com](mailto:adelacruz@caf.com);  
[cespana@caf.com](mailto:cespana@caf.com); [mcastillo@caf.com](mailto:mcastillo@caf.com); [uellzondo@caf.com](mailto:uellzondo@caf.com); [esalias@caf.com](mailto:esalias@caf.com); [nbarqans@dnp.gov.co](mailto:nbarqans@dnp.gov.co);  
[Jesus.Quintana@cqlar.org](mailto:Jesus.Quintana@cqlar.org)

Prepared: Carlos Eduardo Casallas  
Revised: Carolina Díaz Giraldo; Juan Sebastian Rivera



## Environmental and social safeguards report form pursuant to para. 17 of the IDP

<b>Basic project or programme information</b>	
<b>Project or programme title</b>	Climate-smart initiatives for climate change adaptation and sustainability in prioritized agricultural production systems in Colombia (CSICAP)
<b>Existence of subproject(s) to be identified after GCF Board approval</b>	No
<b>Sector (public or private)</b>	Public
<b>Accredited entity</b>	Corporación Andina de Fomento (CAF)
<b>Environmental and social safeguards (ESS) category</b>	Category B
<b>Location – specific location(s) of project or target country or location(s) of programme</b>	Colombia
<b>Environmental and Social Impact Assessment (ESIA) (if applicable)</b>	
Date of disclosure on accredited entity's website	Friday, January 7, 2022
Language(s) of disclosure	English and Spanish
Explanation on language	Spanish is the official language of Colombia and the language understandable to affected peoples/stakeholders.
Link to disclosure	English: <a href="https://www.caf.com/media/3382061/en-2021-04-29-annex-6-esmf-rev011221-clean.pdf">https://www.caf.com/media/3382061/en-2021-04-29-annex-6-esmf-rev011221-clean.pdf</a>  Spanish: <a href="https://www.caf.com/media/3382057/2021-03-31-anexo-6-esia-y-mgas-corto-26042021-rev1-12-2021-clean.pdf">https://www.caf.com/media/3382057/2021-03-31-anexo-6-esia-y-mgas-corto-26042021-rev1-12-2021-clean.pdf</a>
Other link(s)	<a href="https://www.caf.com/es/temas/a/ambiente-y-cambio-climatico/proyectos/">https://www.caf.com/es/temas/a/ambiente-y-cambio-climatico/proyectos/</a>
Remarks	An ESIA consistent with the requirements for a Category B project is contained in the “Environmental and Social Management Framework (ESMF)”.
<b>Environmental and Social Management Plan (ESMP) (if applicable)</b>	
Date of disclosure on accredited entity's website	Friday, January 7, 2022
Language(s) of disclosure	English and Spanish
Explanation on language	Spanish is the official language of Colombia and the language understandable to affected peoples/stakeholders.
Link to disclosure	English: <a href="https://www.caf.com/media/3382061/en-2021-04-29-annex-6-esmf-rev011221-clean.pdf">https://www.caf.com/media/3382061/en-2021-04-29-annex-6-esmf-rev011221-clean.pdf</a>  Spanish: <a href="https://www.caf.com/media/3382057/2021-03-31-anexo-6-esia-y-mgas-corto-26042021-rev1-12-2021-clean.pdf">https://www.caf.com/media/3382057/2021-03-31-anexo-6-esia-y-mgas-corto-26042021-rev1-12-2021-clean.pdf</a>
Other link(s)	<a href="https://www.caf.com/es/temas/a/ambiente-y-cambio-climatico/proyectos/">https://www.caf.com/es/temas/a/ambiente-y-cambio-climatico/proyectos/</a>
Remarks	An ESMP consistent with the requirements for a Category B project is contained in the ESMF.

<b>Environmental and Social Management (ESMS) (if applicable)</b>	
Date of disclosure on accredited entity's website	N/A
Language(s) of disclosure	N/A
Explanation on language	N/A
Link to disclosure	N/A
Other link(s)	N/A
Remarks	N/A
<b>Any other relevant ESS reports, e.g. Resettlement Action Plan (RAP), Resettlement Policy Framework (RPF), Indigenous Peoples Plan (IPP), IPP Framework (if applicable)</b>	
Description of report/disclosure on accredited entity's website	Environmental and Social Risk Assessment of the project is contained in the Environmental and Social Management Framework (ESMF), Gender Assessment (GA) and Gender Action Plan (GAP)/ Friday, January 7, 2022
Language(s) of disclosure	English and Spanish
Explanation on language	Spanish is the official language of Colombia and the language understandable to affected peoples/stakeholders.
Link to disclosure	English: - ESMF <a href="https://www.caf.com/media/3382061/en-2021-04-29-annex-6-esmf-rev011221-clean.pdf">https://www.caf.com/media/3382061/en-2021-04-29-annex-6-esmf-rev011221-clean.pdf</a> - GA <a href="https://www.caf.com/media/3382062/en-2021-03-31-annex-8-gender-assessment-rev-19-11-21-clean.pdf">https://www.caf.com/media/3382062/en-2021-03-31-annex-8-gender-assessment-rev-19-11-21-clean.pdf</a> -GAP <a href="https://www.caf.com/media/3382060/en-2021-03-31-annex-8-gap-rev-19-11-2021-clean.pdf">https://www.caf.com/media/3382060/en-2021-03-31-annex-8-gap-rev-19-11-2021-clean.pdf</a>  Spanish: - ESMF <a href="https://www.caf.com/media/3382057/2021-03-31-anexo-6-esia-y-mgas-corto-26042021-rev1-12-2021-clean.pdf">https://www.caf.com/media/3382057/2021-03-31-anexo-6-esia-y-mgas-corto-26042021-rev1-12-2021-clean.pdf</a> - GA <a href="https://www.caf.com/media/3382058/2021-03-31-anexo-8-analisis-de-genero-rev-19-11-2021-clean.pdf">https://www.caf.com/media/3382058/2021-03-31-anexo-8-analisis-de-genero-rev-19-11-2021-clean.pdf</a> - GAP <a href="https://www.caf.com/media/3382059/2021-03-31-anexo-8-pag-rev19-11-2021-clean.pdf">https://www.caf.com/media/3382059/2021-03-31-anexo-8-pag-rev19-11-2021-clean.pdf</a>
Other link(s)	English <a href="https://www.caf.com/en/topics/e/environment-and-climate-change/projects/">https://www.caf.com/en/topics/e/environment-and-climate-change/projects/</a> Spanish <a href="https://www.caf.com/es/temas/a/ambiente-y-cambio-climatico/proyectos/">https://www.caf.com/es/temas/a/ambiente-y-cambio-climatico/proyectos/</a>
Remarks	N/A
<b>Disclosure in locations convenient to affected peoples (stakeholders)</b>	
Date	Friday, January 7, 2022
Place	Hard copies were made available in CAF's office in Colombia located in Carrera 9 #76-49, Bogota D.C. CP 110221
<b>Date of Board meeting in which the FP is intended to be considered</b>	
Date of accredited entity's Board meeting	Monday, June 6, 2022
Date of GCF's Board meeting	Monday, February 7, 2022

**Note: This form was prepared by the accredited entity stated above.**

## Secretariat’s assessment of FP182

Proposal name:	Climate-smart initiatives for climate change adaptation and sustainability in prioritized agricultural production systems in Colombia (CSICAP)
Accredited entity:	Corporación Andina de Fomento (CAF)
Country/(ies):	Colombia
Programme/programme size:	Medium

### I. Overall assessment of the Secretariat

- The funding proposal is presented to the Board for consideration with the following remarks:

Strengths	Points of caution
Modernization of agricultural extension services and adaptation decision-making at the producer level with cutting-edge technologies, including artificial intelligence and big data.	Relatively high staff costs for scientists and technicians and a need to ensure that funding is used to build the capacity of local actors.
Great potential to attract the private sector in the targeted agricultural value chains (eight crops and livestock) with active financial actors already in place with high demands from local, national and international markets.	
High potential for further scaling up and replication to other <i>gremios</i> (farmer producer groups) once the innovative business models have been developed and proven to be successful through output 3.1.	

- The Board may wish to consider approving this funding proposal with the terms and conditions listed in the respective term sheet and addendum V, titled “List of proposed conditions and recommendations.”

### II. Summary of the Secretariat’s assessment

#### 2.1 Project background

- The agricultural sector in Colombia has been negatively affected by climate change. Its production, yields, land suitability and harvest seasons have all been impacted by higher temperatures, rainfall variability, droughts and a higher frequency of extreme weather events. Projections show that 26 out of 32 Colombian departments are likely to see large yield losses for basic crops associated with food security. Farmers in the regions are not adequately adapting to these climate impacts, owing to costly adaptation technologies, limited knowledge and lack of timely agroclimatic information to help them cope with changing weather patterns and extreme weather events.

4. The objectives of the project are to change the current paradigm of agricultural production of intensive use of conventional agricultural inputs with little adaptation techniques, and to reduce the vulnerability of crops to droughts, floods and other climatic stressors through adopting digital agriculture and adaptation technologies. The project will generate adequate and stable availability of good-quality food by strengthening climate risk management, while reducing greenhouse gas (GHG) emissions from agricultural production. In addition, the project will strengthen the capacities of producers, technicians and institutions so that they can adopt and implement technologies. The project is national in scope, and it considers livestock and eight crops – rice, corn, potatoes, sugarcane, panela sugarcane, coffee, bananas and plantains.
5. The project will contribute to directly benefitting 619,691 rural producers and their families (7 per cent of total agricultural producers in Colombia), and an additional 347,996 people indirectly through the provision of climate information services. It is also expected to increase the climate resilience of the agricultural system across a total of 967,997 hectares, distributed in 22 departments (69 per cent of the country's departments) and 219 municipalities (20 per cent of all municipalities). The project is projected to reduce GHG emissions by 9,152,034 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>eq) throughout its 25-year lifespan.
6. The total project financing is USD 99,910,201, with a request for GCF financing of USD 73,283,080 (grant USD 48,283,080 and loan USD 25,000,000). Corporación Andina de Fomento (CAF) contributes to the project with a senior loan of USD 10,300,000, and co-financing of USD 16,300,000 will be provided by the institutions and entities involved in the project, such as the alliance between Biodiversity International and the International Center for Tropical Agriculture (CIAT) and the farmer groups (guilds or “*gremios*”). The project is submitted under environmental and social safeguards category B.

## 2.2 Component-by-component analysis

### *Component 1: Digital agriculture and climate services for rural modernization with an emphasis on adaptation and mitigation (total cost: USD 39.615 million; GCF cost: USD 26.045 million, or 66 per cent)*

7. Component 1 aims to improve decision-making at the producer level and avoid crop losses through the adoption of digital agriculture, including the use of big data and artificial intelligence. It includes the design, assembly, implementation and operation of climate information services for technicians and producers. In addition, this component includes early warning systems on climate hazards, as well as other sophisticated warning systems on pests, diseases and other abiotic factors that can occur due to climatic phenomena.
8. Under this component, GCF grants and loans will be used to strengthen and modernize the agricultural extension system, and to provide information services to reduce agroclimatic risk. The component seeks to modernize and expand the coverage of agricultural extension in Colombia. More than 2,200 technicians will be trained in using this type of tool, and the component will ensure there is technical support covering the implementation and adaptation and mitigation measures delivered to about 49,200 producers, who are considered direct project beneficiaries.
9. This component shows the key paradigm-shift potential in the proposed project, by bringing in cutting-edge technologies to extension services and farming activities. Adopting artificial intelligence with big data platforms will make it possible to automate crop cycle monitoring and data management, and to produce automatic responses in extension services. The feasibility study assesses the advantages of several proposed technologies compared with conventional statistical methods, and provides sound justification for discarding the conventional methods and opting for the proposed solutions. The target production sites are

well equipped to implement the proposed solutions because such systems are not entirely new for some of the crops (e.g. rice and cotton). The proposal also shows that sufficient technical capacity is in place from both CIAT and Agricultural Research Corporation of Colombia (Agrosavia) to carry out the project activities.

10. The project is structured so that minimum concessionality is sought to make the investments viable with the participation of both the private and public sector. As demonstrated in the financial model, reducing the concessionality would make the project unviable. When reducing the grant amount by a third, for instance, it would make the project unviable for certain *gremios* (i.e. livestock and sugar cane). At reduced levels of grants, the model shows that the project is not viable for most of the *gremios*. This demonstrates that the concessionality in this project, including components 2 and 3, mainly benefits the producer associations, which in turn have committed to provide co-financing so that the project's objectives are met.

*Component 2: Genetic improvement, crop management techniques and other technological options and their scaling up to increase climate resilience and promote low-carbon agricultural development (total cost: USD 48.025 million; GCF cost: USD 37.362 million, or 78 per cent)*

11. Component 2 will improve the resilience of productive systems and promote low-carbon agricultural development, and considers alternatives for genetic improvement by developing new varieties and hybrids that are more resilient to climate impacts, efficient use of water resources and soil, and other adaptation and mitigation options. This component comprises two thematic outputs with their corresponding activities: (i) strengthening the germplasm bank, developing new varieties, and supporting the massive multiplication of seeds for adaptation and mitigation; and (ii) crop management techniques and other technological options and their scaling up to increase resilience and mitigation.

12. Under this component, GCF grants and loans will be used to develop a state-of-the-art phenotyping platform designed to identify climate-resistant genetic resources aimed at developing heat- and drought-resistant, nitrogen-use efficient and low-GHG emission varieties for rice, maize, bananas, sugarcane, panela sugarcane, coffee, potatoes and livestock. Also, GCF funding will be used for implementing a range of crop management techniques on 9,230 hectares of land to increase the efficient use of water resources, restore soil properties, reduce GHG emissions or increase carbon capture, while enabling productivity increases.

13. The proposal provides sound justification for the need of a germplasm bank and development of new varieties that are resilient to climate change, with several alternative options assessed in the feasibility study. There are limited options available in the market in terms of genetic materials, and other solutions such as whole breeding cycle would take a longer time than the project period. A phenotyping platform would thus be the most cost-effective and feasible solution to develop climate-resistant genetic resources.

14. The proposed crop management techniques and technologies are well known and recognized agricultural practices that will produce no-regret results. These techniques will be tailored to the needs of the various crops. The feasibility study presents the detailed steps needed for implementing these agronomic measures, including methods to monitor the GHG emission reductions achieved through implementing such techniques. The proposed interventions, their rationale and the steps for implementation are assessed to be adequate and reasonable to achieve the project objectives.

*Component 3: Innovative and inclusive business models through modernized innovation systems and a more engaged financial sector (total cost: USD 8.571 million; GCF cost: USD 7.169 million, or 84 per cent)*

15. Component 3 aims to develop science-based business models that will enable prioritized value chains to open new commercial opportunities. The component will also transfer modernized technical assistance and agricultural extension services to 2,200 trainees under

component 1. The component is expected to generate eight business models (one per *gremio*) and involve at least four financial institutions (banks, microfinance institutions, insurance companies and so on), incentivizing them to design tailored financial products for the target agricultural value chains.

16. The business model development under this component has been strengthened after extensive reviews conducted during the second-level due diligence. The outputs of this component will include detailed value chain analyses for the target crops, strengthening the *gremios'* capacities to use adopted digital tools, and developing low-carbon and climate-resilient business models for the key value chains. As presented in the feasibility study, there are already well-functioning domestic and international markets with active public and private sectors, including various lending opportunities with financial actors. This output should therefore focus on developing differentiated business models that integrate the technological solutions in agricultural planning and production, providing new commercial opportunities for the private sector in the target value chains.

*Project management (total cost: USD 3.692 million; GCF cost: USD 2.704 million, or 73 per cent)*

17. The GCF portion of the project management cost is about 3.7 per cent of the total requested GCF funding and is compliant with the GCF policy on fees.

### III. Assessment of performance against investment criteria

#### 3.1 Impact potential

*Scale: Medium to high*

18. The project is cross-cutting, aiming to generate both adaptation and mitigation results. The project has substantial mitigation potential, with 9.1 MtCO<sub>2</sub>eq in emission reductions and carbon sequestration over the 25-year project lifetime (0.37 MtCO<sub>2</sub>eq per year). The emission reductions and carbon sequestration will be achieved through rice cultivation (reduction of methane emissions); efficient use of fertilizers; implementing efficient stoves; and applying bio-inputs as well as other adaptation techniques. The baseline emission values for each crop, as well as calculation of emission reductions, are in accordance with the guidelines for emissions inventories in agricultural systems published by the Intergovernmental Panel on Climate Change.

19. Adaptation impact is deemed to be significant: the number of direct beneficiaries is 7.2 per cent of the total producer population in Colombia, and the scope of the project is national, with the project's target departments accounting for close to 70 per cent of the country departments. The project areas have been targeted on the basis of their climate risks and mitigation potential, and agreed among project stakeholders including *gremios*. Rigorous eligibility criteria for selecting project sites, activities and beneficiaries have been submitted as part of the funding proposal package and they are included in the term sheet.

20. As the project scope is at the national level, the climate rationale for the adaptation interventions has been demonstrated in rather a generic manner. Colombia has been experiencing an average temperature increase of 0.13°C per decade between 1971 and 2000, and will continue to be affected by higher temperature, intense rain and drought, and a higher frequency of extreme weather events. The proposal lacks observed historical trends for each identified climate parameter from location-specific representative meteorological stations. While efforts have been made to identify a link between El Niño Southern Oscillation (ENSO) and agricultural productivity in Colombia, the proposal needs to strengthen its information on the observable long-term trend between identified parameters and agricultural productivity.

#### 3.2 Paradigm shift potential

*Scale: Medium*

21. The key paradigm shifting potential in this project is from technological innovation and transfer, whereby digital agriculture (including big data and a bot-based system) will be used for agroclimatic forecasting and for selecting the most suitable adaptation measures for producers. The proposal demonstrates high potential for scaling up and replication for the proposed digital agriculture system. As the project itself is a scaling up of the pilot project implemented by CIAT and the Colombian Ministry of Agriculture and Rural Development (MADR), substantial groundwork has already been done (e.g. the big data platform is already set up for rice, maize and sugarcane), and the project will scale up the system for other crops (potatoes, sugarcane, bananas, and livestock).

22. The proposal presents a detailed market analysis for each target crop and each gremio, in both domestic and international markets. It shows how the proposed project will remove existing financial and socioeconomic barriers to access to markets and amplify income opportunities for the guilds. The project proposal shows there is a high degree of potential to change incentives for market participants by reducing costs and risks, and by eliminating barriers to the deployment of adaptation technologies.

23. The proposal presents a solid financial exit strategy with an operations and maintenance plan as part of the annexes. The various assets to be created (e.g. big data platforms) will be operated and maintained by the *gremios*, while the public goods will be incorporated into Agrosavia's extension systems. Co-financing of USD 16 million from all the participating *gremios* demonstrates their willingness and ownership of the proposed project. The financial analysis of the proposal also shows profitability of the investment for farmers, with concessional financing from GCF and CAF, ensuring the sustainability of the farming activities with adaptation technologies after project completion.

### 3.3 Sustainable development potential

*Scale: Medium*

24. The proposal provides sound justification for its potential to generate positive environmental externalities. The project will contribute to soil conservation, improved sustainability of land management, improved tree coverage, and carbon sequestration through various soil and water conservation techniques. The project will not introduce any genetically modified organisms and invasive species, and will abide to strict regulations regarding the use of chemical fertilizers and pesticides, as provided in the environmental and social management framework (annex 6 to the proposal).

25. The project is expected to produce positive economic and social benefits. It will increase household income from agricultural production by 14.6 per cent, as captured in the logical framework, and increased food security will deliver health and nutritional improvements for the target farmer families. The proposal also provides other economic and social co-benefits that have not been quantified.

26. Gender considerations have been included in the project design with an emphasis on reducing barriers for women producers to participate in local development. A detailed gender assessment and action plan has been developed and was submitted as annex 8 to the proposal.

### 3.4 Needs of the recipient

*Scale: Medium*

27. The vulnerability of the country and the target beneficiaries and their adaptation needs are generally explained throughout the proposal, but without detailed descriptions of the scale and intensity of the country's exposure to climate risks. The impacts of climate change, including incidents resulting in droughts and flooding, on agricultural production and livelihoods are presented. The vulnerability of farmer groups, including women, is

acknowledged, especially with regard to their food insecurity as presented in the funding proposal.

28. Colombia is classified as an upper middle-income country. However, the proposal makes a case that the proposed interventions and the initial cost of technology adoption, require concessional financing to make the project viable. As the *gremios* do not have financial capacity to adopt the required technologies, the Government of Colombia is taking low concessional sovereign loans to support the adoption of low-carbon and climate-resilient agricultural technologies.

29. The proposal explains the needs of the recipient based on the absence of alternative financing. Although such justification is acknowledged, the justification could have been strengthened by providing a wider investment strategy, including a financial estimation of the cost of implementing climate change adaptation measures in agriculture at the national level, and the associated shortfalls in the national budget. Such an exercise would have provided a clear road map or pathway for climate resilience-building in the sector from a financial perspective and would clarify the level of contribution from GCF.

### 3.5 Country ownership

*Scale: High*

30. The proposal demonstrates that the project is aligned with policies and strategies at both the national and the sectoral level, including with the country's nationally determined contribution. The proposal makes it clear which objective the proposed project will contribute to in its national and sectoral strategies.

31. The project will be implemented by two executing entities (EEs): the Ministry of Finance and Public Credit (MHCP) which will be in charge of channelling GCF grants and loans, and MADR which will be responsible for technical implementation of the project, supported by CIAT. CAF, as the accredited entity (AE), submitted a financial management capacity assessment of the EEs and CIAT. MADR and CIAT have track records of implementing similar projects in other regions of the country, with comparable sizes of investments.

32. The project was designed on the basis of rigorous consultations with relevant stakeholders, including the GCF national designated authority, civil society organizations, indigenous peoples, women and other vulnerable groups, and all the stakeholders involved in this project. A stakeholder consultation report was submitted as part of the funding proposal (annex 7).

### 3.6 Efficiency and effectiveness

*Scale: High*

33. The project is highly efficient with a GCF cost of USD 1.45 per tCO<sub>2</sub>eq, which is assessed to be efficient compared with benchmarks of similar investments in similar regional contexts. The project will leverage USD 26.6 million from the co-financiers, with a co-financing ratio of 1:0.36.

34. The proposed structure, with a mix of GCF grants and loans, is assessed to be adequate and reasonable. The AE developed nine financing mix scenarios resulting in various outcomes for the profitability of the activities considered for each producer organization. The scenarios consider different combinations of loans from GCF, CAF and commercial sources, and assess reductions in grant amount of 35 and 75 per cent. The GCF and CAF loan mixture scenario shows that a reduction of 35 per cent of grant component leads to only one out of eight value chains not profitable, while when the grant element is reduced by 75 per cent, four out of eight value chains are not profitable. The model demonstrates that the grant component is more important for the concessional nature of the instruments than the loan component in the profitability of the interventions for each producer association.

35. The proposal demonstrates its cost-effectiveness using a well-established financial modelling methodology. Project internal rate of return (IRR) is estimated at 24 per cent overall or twice the 12 per cent social discount rate used by the AE. The model also estimates IRRs for each value chain or each gremio with economic IRRs ranging from 17 to 29 per cent. The net present value for the eight crop models stands at USD 3.3 billion with technology adoption. The model overall shows that the project is financially viable with GCF concessional financing.

## IV. Assessment of consistency with GCF safeguards and policies

### 4.1 Environmental and social safeguards

36. **Project background.** The project aims to develop, validate, and implement new low-emission and resilient technologies and to scale up existing technologies such as genetic improvements, crop management techniques and other technological options. These actions are to be supported by the implementation and operation of climate information services that will be available to various stakeholders and decision-makers. Among the environmental and social co-benefits are improved tree cover and soil conservation, sustainable land management, and carbon sequestration through implementation of various soil and water conservation strategies. Among the social benefits are improved health and nutrition as a result of resilient food supply, particularly during climate-induced natural events.

37. **Environmental and social risk category and safeguard instruments.** The project is classified as Category B because the project will potentially have limited adverse environmental and social risks and/or impacts which are site-specific, largely reversible and can be mitigated with appropriate environmental and social management measures. An environmental and social assessment is included in the ESMF that has been prepared for the project. The Secretariat confirms that the risk category is aligned with GCF environmental and social risk categorization and is within the risk accreditation level of the AE.

38. **Compliance with the GCF environmental and social safeguards standards.** The paragraphs below summarize the project's compliance with GCF ESS standards and requirements.

39. **ESS 1: Assessment and management of environmental and social risks and impacts.** The project has submitted an ESMF, which included an environmental and social risk assessment and management measures as provided in the included environmental and social management plan (ESMP). The risk assessment was undertaken considering the nature, magnitude, extent/location, permanence, duration, reversibility and significance of the risks/impacts and assessed as either low, moderate or high. The results of the environmental and social risk assessment are presented and an ESMP is proposed that identifies potential impact areas, required mitigation measures, and responsibilities of stakeholders, among other things. The ESMP is built on the assumptions that the project will comply with applicable national laws, regulations and standards for the protection of the environment and communities as well as that of the AE's and GCF ESS. Regarding the potential for conflicts – such as territorial conflicts, armed conflict as well as between beneficiary and non-beneficiary conflicts that may be generated between selected producers and those who may not be selected as beneficiaries of the project – these will be mitigated as part of the site selection where the security and conflict situation will be thoroughly assessed, and low-risk areas will be prioritized and selected for project implementation.

40. **ESS 2: Labour and working conditions.** Potential workers that may be hired by the project (including day labourers, jornaleros) will be engaged under the terms and conditions of the current labour law in the country. Although farmers will be mostly beneficiaries, should farmers also be hired, the same terms and conditions will be applied. The project will also

ensure that there is appropriate occupational health and safety management for the workers – following good international industry practices – to consider issues such as labourers’ working conditions, terms of employment, workers organization, non-discrimination, equal opportunity, child labour, and forced labour of direct and indirect employees, including contracted and third-party workers.

41. **ESS 3: Resource efficiency and pollution prevention.** The project generally seeks to reduce and make more efficient use of resources including agrochemicals and pesticides, although health risks associated with the use of pesticides and chemical inputs in the production process may still continue to occur. The activities of the project aim to reduce the use of these inputs, especially pesticides, in the value chains and to employ more sustainable agriculture practices. Each of the implementing partners will also be assessed and required to have a comprehensive solid waste management plan to manage project-associated waste streams. The project will also promote the implementation of low water consumption technologies and develop guidelines for the efficient use of water resources on farms.
42. **ESS 4: Community health, safety and security.** As indicated above, areas with security and conflict situations will be assessed and avoided as necessary. Regarding community health and safety, each of the implementing partners will be required to have an occupational health and safety plan to manage the risks to people and the environment. Additionally, farmers will receive training on the proper use of pesticides and chemical inputs, as part of the training and capacity-building on good agricultural practices.
43. **ESS 5: Land acquisition and involuntary resettlement.** The AE stipulated that the project will have no interventions that will require the displacement of people, either physically or economically, including potential involuntary restrictions on land use and access to natural resources that may result in the communities losing access to these resources for their livelihoods and other economic activities. This is also highlighted in the project’s ESMF. Formal agreements between project beneficiaries and implementing partners will also be acquired.
44. **ESS 6: Biodiversity conservation and sustainable management of living natural resources.** The project’s activities under component 2 will promote management practices and other technical options that will increase resilience through agroforestry arrangements, rational use of fertilizers and bioproducts, optimization of irrigation systems, implementing conservation agriculture using harvest residues, and implementing landscape-level conservation and restoration strategies. This includes adopting restoration guidelines published by the Ministry of Environment which prioritizes use of native species. Regarding the potential for introducing genetically modified organisms (GMOs), the AE stipulated that the project will not introduce any GMOs and invasive species, and that the project will comply with existing national regulations regarding restrictions and the permit system. The AE also stated that attention will be paid to interventions (e.g. in potato and livestock value chains) that will be carried out in surrounding areas of moorland ecosystems, such as prohibiting the use of heavy machinery in agricultural activities; the final disposal, management and burning of solid and/or hazardous waste; the introduction and management of GMOs and invasive species; and burning, logging and fumigation and spraying of chemicals. The project will also explore relationships with various conservation-focused institutions to establish partnerships on knowledge and information relating to ecosystem services, biodiversity and sustainable practices that are beneficial to the stakeholders of the project, particularly on managing potential negative impacts of agricultural and livestock activities in the delimited moorland areas (“paramos”), among others.
45. **GCF Indigenous Peoples Policy and ESS 7: Indigenous peoples.** The AE confirmed that the project will not have a direct impact on indigenous peoples and their territories. To encourage the participation of producers from ethnic groups in the project, the ethnic differential approach is included in the baseline, the risk assessment, and the mitigation measures, and as well as in the disclosure and engagement processes to be implemented by the

project. Specific measures to achieve this ethnic differential approach are: including people from ethnic communities in the project's intervention areas and in the project's technical team, especially in the group of extension workers, to build trust and facilitate work with the communities while building local capacity; identifying producers from ethnic communities in the information-gathering forms and the databases of the producer associations; and preparing a guideline to advance the incorporation of the ethnic differential approach in the internal policies of the producer associations participating in the project. If in the future the project directly affects indigenous peoples the project will only proceed in accordance with the GCF Indigenous Peoples Policy and domestic law.

46. **ESS 8: Cultural heritage.** The ESMF indicates that the project could have adverse impacts on cultural heritage in the project sites, specifically regarding the potential for "loss of cultural diversity due to limited recognition of local knowledge and traditional productive practices, such as community seed storage/banks, among others, related to the project's value chains". The project plans to mitigate this through "social appropriation of knowledge" that will recognize and document "existing traditional practices, especially in the potato, corn, sugar cane value chains". The project's physical interventions will, however, be implemented in farm areas that have already been cultivated with conventional agriculture; thus the project's activities are not expected to have adverse impacts, particularly on physical cultural resources. In the very remote possibility that these occur, the project will follow the guidelines on cultural heritage of the current laws of Colombia.

47. **Implementation arrangements.** The project will have a project management unit that will be responsible for implementing the project's ESMF. This will be coordinated with various stakeholders such as through CIAT, the producer associations, Agrosavia, and other implementing partners. The project management unit will also have an environmental, social and gender team that will oversee the technical requirements of the project, such as designing guidelines, plans and strategies for the ESMF; providing support during implementation, monitoring progress and compliance; and supporting the review and updating of the ESMF. The ESMF will also be made part of the documents of the call for proposals throughout the life cycle of the project to ensure that effective implementation of the ESMF and adequately management of the adverse impacts of the project's activities at each stage of the project implementation.

48. **Stakeholder engagement and grievance redress mechanism (GRM).** The project has conducted interviews and group sessions with stakeholders in the formulation process of the ESMF. A stakeholders' participation plan has also been developed that provides details about the kick-off workshop, participation strategies, and complementary measures and mechanisms to disseminate the plan. The plan likewise proposes mechanisms to maximize beneficiary participation in decision-making bodies such as the technical committees. The project will further design and implement a communications plan to ensure that workshops and other information dissemination and socialization strategies are further defined, prepared, convened and organized. The project will also establish a GRM that will address issues and complaints that may arise in the implementation of the project. It includes step-by-step procedures, responsible parties and timelines that are aimed at addressing grievances to be resolved promptly and effectively.

## 4.2 Gender policy

49. The AE has provided a gender assessment and gender action plan, and therefore complies with the requirements of the GCF Gender Policy.

50. The gender assessment provided illustrates the existence of an enabling environment that is conducive to the pursuit of gender equality and women's empowerment. Colombia has ratified important international instruments and its Constitution guarantees equal rights and opportunities to women and men. The laws enacted dictate equal opportunities for women as

well as guarantees that women live free of violence, while the country includes the care economy in its national accounts system. Colombia also has a national public policy on gender equity with the view to guarantee rights to women as well as the mainstreaming of gender issues in all sectors of the economy.

51. The gender assessment provided by the AE was compiled on the basis of desk reviews and stakeholder consultations with female producers and associations. The assessment included an institutional capacity analysis, as well as discussions with association officials, extensionists, affiliated female and male producers, and institutional actors. The assessment indicates that rural women are disproportionately affected by climate change and their situation is exacerbated by the gender norms and relations in the household and on the farm. Compared with men, women have lower engagement in production-related decision-making, have low access to and control over land and financial and technological resources, and therefore have lower incomes and face higher levels of poverty, particularly female-headed households. Women more than men are responsible and burdened with domestic and unpaid care work, with women spending approximately 8 hours a day on such tasks, compared with 3 hours by men. These realities limit women's ability to develop adaptation strategies to manage and cope with climate-induced vulnerabilities, and contribute to the deepening of food insecurity as well as water and resource constraints.

52. Further, in the agriculture sector, women producers face challenges in getting access to productive assets such as land, technical assistance and credit. These challenges are seen in the value chains of the eight crops that are the focus of this project as well. The banana, corn, rice, livestock, and potato chains have the lowest proportion of production units headed by women (less than 20 per cent and, in the case of bananas, the figure does not exceed 10 per cent). The issue is not only that women lack access to land but it is also the size of land they own or manage, which is on average 72.9 per cent of the size of the land owned by men (the greatest differences are found mainly in the cattle chain, where it is only 41 per cent). Access to credit is an issue for women and men alike, with under 20 per cent of people – regardless of the crop – able to receive some method of financing for production. Most of the producer associations also reflect the existing disparities in the participation and benefit of women. The associations lack capacity, awareness, institutional mechanisms and instruments to identify and address the challenges faced by women in the sector.

53. The AE has provided a gender action plan and therefore complies with the requirement of the GCF Gender Policy. The gender action plan contains activities, targets, indicators, budget, timelines (by way of schedule and annual budget) and gender experts to support with the implementation of the gender action plan and to mainstream gender across the project. The implementation of the gender action plan will also involve the Ministry of Agriculture's Rural Women's Directorate. The activities included in the gender action plan will address the issues raised in the assessment, thereby promoting gender equality in systems and institutions. It will ensure men and women producers have equal access to information on seasonal climate forecasts in agriculture and that access to women producers for agricultural extension services is made possible. It will work towards ensuring changes and improvements in the number of women with decision-making roles, thereby making women beneficiaries leaders in the process of implementing CSICAP's plans and activities for the conservation, preservation and restoration of strategic areas and ecosystems (e.g. fertilizers and bioproducts for the management of pests and diseases, led by women farmers' groups and/or organizations). To address capacity and training opportunity gaps, the project will target training for women and will disseminate modules for young rural women on primary processing, management and marketing, among other topics. It will reduce structural barriers to women by making access to credit easier, ensuring women participate in farmers' groups or organizations and ensuring women's engagement in the boards of directors of the producer associations. Acknowledging the importance and burden of care work on women, the project will work on ensuring the availability of local care services while at the same time raising awareness of gender issues and

gender-based violence among both women and men. The latter could also be reported using the project-level grievance redress mechanism, which will focus on complaints from women and ethnic groups.

54. The activities included in the gender action plan are intended to empower women and the community at large by providing women with training, access to information on agricultural value chains, agroclimatic information, information and communication techniques, and mechanisms for the prevention of violence against women, while also creating an enabling environment for women to participate more in decision-making and sustainable practices on agricultural value chain issues. These activities are also expected to support women to improve their productivity, sphere of influence and capacity in the agricultural sector, as well as to increase their incomes.

## 4.3 Risks

### 4.3.1. Overall programme assessment (medium risk)

55. The objective of the project is to reduce the vulnerability of agricultural production to climatic threats, to minimize the impacts of those threats on the competitiveness of the agricultural sector, and to have an adequate and stable availability of quality food by strengthening climate risk management, while reducing GHG emissions from agricultural production. CAF is the AE of the project and the Government of Columbia will be the EE. The GCF financing consists of (i) a sovereign loan to the Government of Columbia of up to USD 25million and up to USD 48.3 million in grants. The AE will co-finance a loan of USD 10 million and grants will be provided by local producer associations totalling USD 16.3 million. Both the reimbursable and non-reimbursable funds provided by the GCF and the AE will be used by the EE to provide grants to the beneficiaries.

56. The project comprises three components: (i) digital agriculture and climate services for rural modernization with an emphasis on adaptation and mitigation; (ii) Genetic improvement, crop management techniques and other technological options and their scaling up to increase climate resilience and promote low-carbon agricultural development; and (iii) innovative and inclusive business models through modernized innovation systems and a more engaged financial sector.

### 4.3.2. Accredited entity/executing entity's capability to execute the current programme (medium risk)

57. The CAF is the AE for the project. CAF is rated A+ by Standard & Poor's and Fitch. CAF has a local presence in Columbia and nearly 11 per cent of CAFs portfolio (at year end 2019) is located in Columbia. CAF has two approved GCF projects totalling over USD 230 million in project value. The Government of Columbia is a shareholder of the AE.

58. The Government of Colombia will be the EE and will be the entity responsible for the project resources through MHCP, both credit and grant resources from the GCF and resources provided by the AE. MADR will be responsible for executing the project resources and technical implementation.

### 4.3.3. Project-specific execution risks (medium risk)

59. Demand risk: the success of the project depends on the demand of local farmers for the new technologies. Low uptake could result in project delays or lower-than-expected impacts. This risk is partially mitigated by (i) involving farmer organizations; and (ii) the relatively high expected IRRs providing financial incentives for uptake by farmers.

60. Credit risk: The GCF and AE will be exposed to repayment risk for the sovereign loan to Columbia. Columbia is rated BB+ by Standard & Poor's and Fitch. The AE will be the lender of record and enjoys de facto preferred creditor status. Historically, none of the AE's sovereign loans have ever been placed in non-accrual status or been written off.

61. Operations and maintenance (O&M) risk: after the implementation period of the project the O&M costs and insurance will not be covered by the project but by the producer associations. Project success will therefore depend on the continued capability of the producer associations to support these costs. Creation of O&M plans and technical support to the producer associations is part of the project.

62. Delay and cost escalation: as result of lack of supply or increased price of inputs, human resources and tools, delays and costs escalation might occur, reducing the impact of the project. Currency fluctuations can also result in changes in costs. Comfort can be derived from contingencies in the budget and envisioned in the project planning.

#### 4.3.4. Project viability and concessionality

63. GCF will provide both grants and low concessional loans. The EE will use both reimbursable and non-reimbursable funds to provide grants to beneficiaries. The economic and financial analysis shows a high average IRR of 201 per cent for the beneficiaries, suggesting that there is potential for reflows and therefore reduced amounts of grants from GCF. The AE considers that reimbursable instruments are not viable because investments are mostly public goods and not owned by the farmers.

#### 4.3.5. GCF portfolio concentration risk (low risk)

64. In case of approval, the impact of this proposal on the GCF portfolio concentration in terms of result area and single proposal is not material.

#### 4.3.6. Compliance risk (medium risk)

65. The recipient country, Colombia, is not subject to United Nations Security Council restrictive measures. The AE has performed due diligence on the two EEs –MHCP and MADR – and has determined a medium risk when it comes to their ability to mitigate money laundering, terrorist financing and prohibited practices risks. In addition, the AE has undertaken due diligence on CIAT and did not identify any red flags that would prevent CIAT from fulfilling its responsibilities in the funded activity. The AE has also performed a project-level risk assessment for money laundering, terrorist financing and prohibited practices and has determined a low probability and high impact. In addition to its standard set of internal controls, the AE will ensure that beneficiaries receiving equipment are subject to adequate training as well as an agreement that prohibits them from engaging in selling the equipment to third parties.

### Summary risk assessment and recommendation

Summary risk assessment		Risk assessment
Overall project/programme	Medium	Medium risk classification as a result of the experience of the accredited entity in the country, the operations and maintenance risk, impact of cost increases and demand risk of the project
Accredited entity/ executing entity capability to implement the project/programme	Medium	

Project-specific execution	Medium	
GCF portfolio concentration	Low	
Compliance	Medium	

#### 4.4 Fiduciary

66. CAF is the AE for the project and the EEs of the programme are the Government of Colombia (through MHCP and MADR) and CIAT.

67. MHCP will be the entity responsible for the project resources, both credit and grant resources from the GCF as well as CAF financing resources. The Government of Colombia will take loans from both GCF and CAF, and will provide grants to the beneficiaries (*gremios*).

68. MADR is the main EE along with CIAT. MADR will be responsible for supervising the technical implementation of the project, in accordance with its own internal rules, policies and procedures, including the administration and management of the use of GCF resources, as well as the follow-up, evaluation and reporting responsibilities. It will be responsible for executing the resources and technical implementation of the project through the Directorate of Innovation, Technological Development and Sanitary Protection. Also, MADR will be responsible for supervising CIAT to ensure that all activities are executed on time and with the required quality, to ensure that the project aims are achieved. MADR will receive technical support from the alliance between Biodiversity International, CIAT and other partner organizations.

69. The loan resources will be administered according to the CAF Credit Process Manual which guides the process for all phases of credit, including (i) origination; (ii) evaluation; (iii) approval; (iv) formalization; and (v) administration. The non-reimbursable resources of the GCF, on the other hand, will be executed by the Government of Colombia, through MADR and CIAT.

70. MADR will be responsible for the project financial execution and implementation before MHCP and CAF. CAF and the Government of Colombia, through MHCP and MADR, will enter a subsidiary agreement for the use of GCF funds. MADR will carry out direct contracting with CIAT under the Colombian legal framework called the Technical and Scientific Cooperation Agreement. The Government of Colombia, acting through MADR, will retain the final approval authority over any matter/decision adopted by the project cooperation team/any other governance bodies or units. MADR will have support in the operation of the project from the Alliance of Biodiversity International and CIAT, and the producer associations, following the regulations and frameworks defined and allowed by Colombian legislation. These arrangements will be reflected in the agreement signed between MADR and CIAT.

71. CIAT will form a project coordination team (PCT) that will be directly responsible for interacting with the project executing unit within MADR and responding to its technical and administrative requirements. The PCT will be responsible for implementing the project and will guide the six theme leaders and eight crop coordinators. The team will work with the relevant areas of MADR, CIAT, the strategic partners, and any other institution, firm, or person contracted to provide a service or supply a good. The PCT will be responsible for the project's institutional relationships, led by the project leader, and therefore must respond to MADR, which will ensure the proper execution of the project and the adequate use of resources. The team will be responsible for preparing the technical reports and submitting them to MADR and preparing the financial report. The interaction between MADR and CIAT will be carried out through the project executing unit (MADR) and the PCT (CIAT).

72. The financial control and procurement processes will be implemented in accordance with the rules and regulations of the CAF, which were certified in the accreditation process before the GCF. During project execution, CAF will supervise and guarantee quality in accordance with its policies and procedures. This will include follow-up missions, spot checks, and participation in steering committee meetings. The project will be subject to the CAF audit regime, which includes external and internal auditing.

## 4.5 Results monitoring and reporting

73. As a cross-cutting initiative, the programme aims at generating both mitigation and adaptation benefits. On the mitigation side, the intervention is expected to result in overall GHG emission reductions of 9,152,034 tCO<sub>2</sub>eq over the project lifespan of 25 years, as per the metrics of the GCF core indicator for mitigation (based on the GHG accounting methodology detailed under annex 22 of the funding proposal). On the adaptation side, 619,691 direct beneficiaries and 347,9996 indirect beneficiaries are expected as adaptation impact. The AE provided a robust methodology and rationale for defining both direct and indirect beneficiaries in annex 24 of the funding proposal.

74. The theory of change diagram adequately captures different levels of expected changes as well as logical linkages between them from the goal statement to the proposed activities. The barriers and risks that may hinder the achievement of these changes are identified and linked to pertinent activities which will tackle them.

75. The logical framework has been designed in accordance with relevant GCF-level impacts and outcomes as well as with project-specific outputs. In most cases baselines and targets of each indicator are provided on the basis of data available from credible sources, such as national surveys.

76. It is welcome to have a baseline study in the first year of project implementation as indicated in annex 5 (Implementation timeline) of the funding proposal, through which the AE will establish concrete definitions and methodologies for its performance indicators. The timeline also indicates the submission timings of annual performance reviews and deliverables of each subactivity.

77. Annex 11 (Monitoring and evaluation plan) of the funding proposal clearly describes the key concepts and elements of the monitoring and evaluation system and how it will be reported back to the GCF.

## 4.6 Legal assessment

78. The Accreditation Master Agreement was signed with the Accredited Entity on 15 November 2016 (the “AMA”), and it became effective on 19 March 2018.

79. The Accredited Entity has not provided a legal opinion/certificate confirming that it has obtained all internal approvals and it has the capacity and authority to implement the project. It is recommended that, prior to submission of the Funding Proposal to the Board (a) the Accredited Entity has obtained all its internal approvals and (b) the Fund has received a certificate or legal opinion from the Accredited Entity in form and substance satisfactory to the Fund confirming that all final internal approvals by the Accredited Entity have been obtained and that it has the authority and capacity to implement the project.

80. The proposed project will be implemented in Colombia, a country in which GCF is not provided with privileges and immunities. This means that, amongst other things, GCF is not protected against litigation or expropriation in this country, which risks need to be further

assessed. The GCF provided an updated draft agreement on privileges and immunities, along with a background note, to the host country on 8 April 2019.

81. The Heads of the Independent Redress Mechanism (IRM) and Independent Integrity Unit (IIU) have both expressed that it would not be legally feasible to undertake their redress activities and/or investigations, as appropriate, in countries where the GCF is not provided with relevant privileges and immunities. Therefore, it is recommended that disbursements by the GCF are made only after the GCF has obtained satisfactory protection against litigation and expropriation in the country(ies), or has been provided with appropriate privileges and immunities.

#### 4.7 List of proposed conditions (including legal)

82. In order to mitigate risk, it is recommended that any approval by the Board is made subject to the following conditions:

- (a) Submission by the Accredited Entity to the Fund of a certificate or legal opinion, in form and substance satisfactory to the GCF Secretariat, within 120 days after Board approval, confirming that the Accredited Entity has obtained all final internal approvals needed by it and has the capacity and authority to implement the proposed project;
- (b) Signature of the funded activity agreement in a form and substance satisfactory to the GCF Secretariat within 180 days from the date of Board approval, or the date the Accredited Entity has provided a certificate or legal opinion confirming that it has obtained all final internal approvals, whichever is later; and
- (c) Completion of the legal due diligence to the satisfaction of the GCF Secretariat.

## Independent Technical Advisory Panel's assessment of FP182

Proposal name:	Climate-smart initiatives for climate change adaptation and sustainability in prioritized agricultural production systems in Colombia (CSICAP)
Accredited entity:	Corporación Andina de Fomento (CAF)
Country/(ies):	Colombia
Programme/programme size:	Medium

### I. Assessment of the independent Technical Advisory Panel

#### 1.1 Impact potential *Scale: Medium to high*

1. **Concept.** This is a semi-experimental funding proposal for upscaling and upgrading the 'digital agriculture'<sup>1</sup> pilot initiative of the Government of Colombia. The proposal targets nine agriculture value chains (rice, maize, potato, sugarcane, panela cane, coffee, bananas, plantains and livestock) in six agroclimatic zones of Colombia.<sup>2</sup> The CSICAP initiative has a nation-wide approach and will be implemented in 22 departments and 219 municipalities of Colombia, directly benefiting 619,691 people, of whom more than 194,871 are farmers from different producers' associations and about 424,820 people their family members. The funding proposal is expected to reduce or avoid 9.15 million tCO<sub>2</sub>e during the 25-year lifespan of the project (366,081 tCO<sub>2</sub>e annually).

2. The pilot phase of the digital agriculture initiative was initiated in 2012 by the Alliance of Biodiversity International (the Alliance) and the International Center for Tropical Agriculture (CIAT)<sup>3</sup> in cooperation with the Ministry of Agriculture and Rural Development/Ministerio de Agricultura y Desarrollo Rural (MADR) of Colombia and was implemented in 2013–2015. It covered mainly two value chains (rice and maize) in eight departments of Colombia. The capacities of two crop producer associations, known as gremios,<sup>4</sup> Fedearroz (rice) and Fenalce (maize), were strengthened during the pilot. The results of the pilot phase were assessed on success, barriers and gaps and supported development of this funding proposal.

3. The pilot phase had four basic activities to mitigate climate change effects on Colombian farmers and these remain as key activities in the funding proposal:

- (a) *Agroclimatic risk management* focuses on development and validation of climate variability and long-term predictions for agricultural sectors in different Colombian

<sup>1</sup> Digital agriculture refers to agricultural practices that digitally collect, store, analyze, and share electronic data and information along the agricultural value chain.

<sup>2</sup> Considering the most general classifications, the project covers 6 of the 7 agroclimatic zones of the country and 22 (40 per cent) of the 54 subregions considering more detailed agroclimatic classification.

<sup>3</sup> See overview: <https://www.cgiar.org/?s=International+Center+for+Tropical+Agriculture>

<sup>4</sup> A 'gremio' refers to a crop-specific private sector organization consisting of small, medium and large-scale farmers, which aims to support the category to improve competitiveness and income profitability. These organizations are nation-wide in Colombia and have branches in all relevant areas for each specific agricultural system. Usually, the gremios provide a variety of services including, but not limited to, research and innovation, technical and commercial assistance and input provision. Most gremios were established decades ago. They also represent farmers before governmental institutions so that their needs are addressed. Some of those organizations have separate research and innovation entities to support farmers.

- regions to improve crop management. During the pilot phase progress was made in the development of climate forecast models and their validation for some of the prioritized zones and the first site-specific agriculture analyses were also carried out on the behaviour of selected crops under climate variability;
- (b) *Site-specific agriculture management* includes identification problems that limit agricultural sector growth, collect information at the farm level, and propose technological solutions adapted to the producer's needs under climate variability. Genetically improved species with tolerance to drought and waterlogging were evaluated and the water footprint was measured for different production systems, including rice, during the pilot;
  - (c) *Testing new agricultural technologies for adaptation to climate change hazards and mitigation of greenhouse gases (GHGs)* aiming to define agricultural innovations and best agricultural management practices that contribute to reducing GHGs emissions and offer alternatives for adapting to climate change. During the pilot stage the carbon footprint of palm trees, intensive silvopastoral systems and fruit trees was measured. Soil loss and the water footprint of potatoes were also measured, and cassava materials were evaluated.
  - (d) *Evaluating sustainable production systems* targeting the identification of sustainable production systems adapted to the national context and training interested partners in using new tools and technologies to mitigate climate change effects. In the pilot phase capacity-building was provided for the technical staff of gremios, and in some specific areas information was delivered directly to producers. Targeted Gremios, Fedearroz and Fenalce, respectively for rice and maize, have found great potential in the information and tools generated during the two years of work.
4. The independent Technical Advisory Panel (TAP) considers that the main result of this pilot is the joint work carried out between the national Government, academia, research centres, non-governmental organizations (NGOs), producer associations and farmers.
5. The funding proposal consists of three interconnected components each with two result areas also covering the territories targeted during the pilot phase:
- (a) **Component 1** covers deployment of digital agriculture and climate services for rural modernization with an emphasis on adaptation and mitigation. Component 1 activities will be carried out in 179 municipalities in 6 agricultural subregions (Dry Caribbean, Humid Caribbean, Inter-Andean Valleys, Foothills/Mid-mountain, High Mountain, Eastern Plains).
- Result 1.1* is strengthened and modernized digital agricultural and extension systems with an emphasis on adaptation and mitigation. Seven 'Big Data'<sup>5</sup> platforms will be established (*design, assembly, implementation and operation*) to supply analyzed and processed information that considers user's social, ethnic and gender differences; producer associations are empowered to deliver recommendations on adaptation and mitigation measures to producers; management of agroclimatic risks allows provision of timely and reliable information to more than one million users (considered indirect beneficiaries) on the main climatic threats and crop management recommendations to avoid losses.
- Result 1.2* is established and/or strengthened agroclimatic services to provide recommendations on adaptation and mitigation measures. Direct technical support is provided to approximately 123,389 producers and indirect support to 104,000 users

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<sup>5</sup>Big Data Technologies can be defined as software tools for analyzing, processing, and extracting data from an extremely complex and large data set with which traditional management tools can never deal.

and 15 Agroclimatic Technical Working Groups which will receive recommendations through the climatic services platforms on how to reduce crop losses.

- (b) **Component 2** considers improvement of genetic resources (tolerance to climate variability), crop management techniques and other technological options and their scaling-up to increase climate resilience and promote low-carbon agricultural development. Activities of component 2 will take place at CIAT's campus in Cali, Colombia, and at experimental stations located in the same six agricultural subregions as component 1.

*Result 2.1* is a strengthened germplasm bank, new climate resilient varieties developed, and their seeds massively distributed. A key deliverable is design and development of a state-of-the-art Phenotyping Platform to identify low-carbon production and climate-resistant genetic resources (heat, drought and excess water-tolerant varieties).

*Result 2.2* is improved knowledge on the water and carbon footprints of selected value chains. In this regard development of new crop management techniques and technologies and scaling up existing technologies to increase climate variability resilience and GHG mitigation will be supported in the targeted value chains for different types of farmers. As a result of this activity at least 30 new low-emission and resilient technologies should be developed, validated and implemented and 70 existing technologies (genetic improvement, crop management techniques and other technological options)<sup>6</sup> should be scaled up. In 131,710 hectares resilience to climate variability is increased and in 8,750 hectares low-carbon agricultural practices are promoted, reducing 432,297 tonnes of CO<sub>2</sub>e. These activities will mainly take place at CIAT's campus in Cali, Colombia, and at experimental stations located in the six agricultural subregions (Dry Caribbean, Humid Caribbean, Inter-Andean Valleys, Foothills/Mid-mountain, High Mountain, Eastern Plains) since they must be performed under controlled conditions.

- (c) **Component 3** should ensure identification and implementation of innovative and inclusive business models through modernized innovation systems and a more engaged financial sector. As this component will be supporting the implementation of the first two components, component 3 will be implemented in all the previously prioritized locations.

*Result 3.1* of this component is improved business models that provide farmers with reasonable profits and improved GHG mitigation practices. In particular, improved business models on climate resilience and low-carbon technologies will be operational and effective for at least 60 entities of the agricultural sector (including Departmental and Municipal Agriculture Secretariats) covering 4,400 technicians.

*Result 3.2* should be modernized technical assistance and agricultural extension services with multi-tool strategies, adapted to specific environmental, social, gender and productive contexts at the national level. Reinforced training will be provided to 54,000 agricultural producers for low-carbon and resilient agriculture considering environmental, social and gender aspects.

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<sup>6</sup> In the case of rice and maize, the aim is to scale up technologies that were previously evaluated in the pilot and were found to perform well. For example, the MIRI (multiple-inlet rice irrigation system) for low water consumption in rice; Cenicaña (private, non-profit corporation, founded in 1977 at the initiative of the Association of Sugar Cane Growers of Colombia) developments in the efficient use of water, Augura developments in bio-pesticides and efficient use of fertilizers; Fedepanela with more efficient burner systems and fertilizer use; Fedegan, CIPAV, Agrosavia and the CIAT Biodiversity Alliance with sustainable livestock systems model; Cenicafé with systems for the efficient use of fertilizers and harvesting, treatment and use of water in agroforestry models; in potatoes with minimum tillage and conservation agriculture developed by the CIAT Biodiversity Alliance.

6. An important step that is expected to be taken with this project is to improve the information available at site-specific level, and to accompany that information with recommendations that are supported by predictions with high performance that make it possible to generate a good degree of confidence in producers. The proper selection of a variety in relation to the local environmental resources can make a difference of up to 40 per cent in yield. However, this must be complemented with the development and implementation of technologies to face different circumstances that may arise due to the predicted climatic conditions. In this sense, it is necessary to develop technological options to maintain high yields under different types of stress factors, for example, abiotic factors, such as low solar radiation, high nighttime temperatures, high CO<sub>2</sub> concentrations and reduced rainfall (drought), as well as biotic factors that can be exacerbated when certain climatic circumstances occur, as is the case with phytosanitary problems

7. In the opinion of the independent TAP, the funding proposal is quite innovative and has potential to achieve high impact in agriculture and food security. However, there are still barriers which should be taken into consideration, such as vertical dissemination of scientific results achieved and shared with gremios. As was identified within the pilot phase, while interaction between the Alliance and the associations was good, the producers' vertical dissemination was not always satisfactory. It is key to incorporate spaces and strategies that allow farmers to be massively involved and to ensure an equal level of access to the digital communications for all farmers. As these gaps could significantly affect the final impact of the initiative, the independent TAP scored this criteria medium to high.

## 1.2 Paradigm shift potential

*Scale: High*

8. The independent TAP considers that the success of this approach, as described in the funding proposal, could significantly contribute to the future of sustainable and safe food security.<sup>7</sup> According to the Food and Agriculture Organization of the United Nations (FAO), to produce a “sustainable food future”, the world must increase food production while cutting GHG emissions and maintaining (or reducing) the land used in agriculture and ‘digital agriculture’ could address these challenges by making the agricultural value chain more efficient, equitable and environmentally sustainable. To achieve this agricultural research, extension and advisory services are essential.<sup>8</sup> FAO describes the digitalization process of agriculture as a revolution, namely, a digital agricultural revolution.

9. As introduced in the impact assessment section, this proposal offers upscaling and upgrading of the “digital agriculture programme” pilot phase initiated in Colombia in 2012. The funding proposal plans to scale up (for new crops and agroclimatic regions) successful findings (for rice and maize) and upgrade activities for assessment of risks not considered or not fully successful during the pilot stage with strengthening the understanding of how climate affects the various farming systems and value chains through crop-climate modelling and empirical data analysis.

10. As was reported in the accredited entity's (AE) responses on the independent TAP questions, one of the key successes of the pilot phase was establishing digital and participatory climate services platforms led by the Local Technical Agroclimatic Committees. These Committees have transformed Colombian agriculture in five ways: (1) increasing confidence in the quality of climate and agroclimatic information; (2) enhancing the level of understanding of agroclimatic information; (3) spreading climate knowledge across the territory; (4) transforming the way crops are produced in certain regions; and (5) leading to institutional and policy changes. A Pledge by the MADR to create 15 Local Technical Agroclimatic Committees by

<sup>7</sup> According to FAO and World Resource Institute (WRI) preliminary estimations, “The world will need to produce 50% more food (as compared to 2010, under ‘business as usual’ growth) to feed over 9 billion in 2050.”

<sup>8</sup> Research and Extension | FAO | Food and Agriculture Organization of the United Nations.

2030 has already been met with the support of FAO and Consortium of International Agricultural Research Centers (CGIAR).

11. The independent TAP considers that such joint activities from government and scientific institutions for gathering locally tested scientific and experimental information for further identification of gaps and planning improvements in consultations with farmers and farmers' associations should have real transformational impact in the agriculture sector. The independent TAP agrees with the project proponents that "as long as adaptation continues to be considered as a problem of generalizing around some intuitive measures, we will be far from real, competitive and site-specific solutions."

12. The Approach offered in the funding proposal is progressive and covers most of the gaps existing in the agriculture sector on how to reduce the sector vulnerability including climate change vulnerability and produce low-emission safe food products in a sustainable way. The proposal has to ensure maximum digitalization of entire value chains for nine agricultural activities; monitor the vulnerability of crops to climate variability and to climate hazard; model future climate change at local level; manage information with Big Data Systems and Phenotyping Platforms; improve resilience of crops to climate change through modification of germplasm; ensure horizontal and vertical dissemination of information (early warning process, innovative technics, technologies and tools); ensure security of biodiversity, food and health related to the genetic modification of crops; develop and implement novel and inclusive business models; ensure financial institutions access to information to develop tailored financial products that support scaling of climate-smart technologies; and gremios to have close to 100 per cent capacity in each of the technologies proposed in the framework of the project.

13. The independent TAP recognizes the complexity of the activities planned but at the same time understands that only a combination of all the activities listed above could bring real impact and effect, real transformational change. The independent TAP confirms that the role of this funding proposal is crucial to accelerate a paradigm shift process in the country's agriculture sector initiated by the pilot phase. In case of success, the approach could also be a model for other agricultural countries.

### 1.3 Sustainable development potential

*Scale: Medium to high*

14. A comprehensive Environmental Safeguards Monitoring Framework (ESMF) is provided for this funding proposal where all potential risk areas and mitigation measures for each component are detailed. During the review Component 2 was particularly targeted for assessment of risks and mitigation measures. The incorporation and enforcement of the risk mitigation measures will minimize potential adverse impacts of the project on the environment, communities and project beneficiaries. The project's information disclosure strategy and grievance redress mechanism seek to promote transparency and accountability among stakeholders.

15. Component 2 of the funding proposal consists of activities related to the increase of crop resilience to climate variability and long-term changes in agroclimatic zones. Among such activities are genetic modification for development of improved seeds, hybrids and clones resistant to effects associated with climate variability and pest resistance, and the dissemination of these modified seeds in regions with similar conditions. Such activities could have some risks for biodiversity and health, as well as for sustainable development processes in general, and require relevant control by the Government and through international treaties. Within this context special attention was given by the independent TAP to the project's ESMF, which is annex 6 of the funding proposal package.

16. The ESMF document demonstrates that where research on genetic improvements of crops and the introduction of genetically improved organisms are carried out, there will be

compliance with the provisions and restrictions established by the country in current regulations.

17. The ESMF considers all relevant regulations in force in this area including chapter 2 (Basic Genetic Materials of Improved Seeds) and chapter 3 (Living Modified Organisms) of the Sole Regulatory Decree of the Agriculture, Livestock, Fisheries and Rural Development Administrative Sector, Decree 1071 of 2015, in particular:

- (a) Article 2.13.7.2.2.1 which determines that the Ministry of Agriculture and Rural Development, through the Colombian Agricultural Institute (ICA), has the function of supervising the registration, certification, multiplication and distribution of all improved material intended for food or industrial crops;
- (b) Article 2.13.7.2.2.3. defines that basic genetic materials produced by private industry that are to be delivered for multiplication and distribution to the public, in the form of improved materials, must be registered with the ICA;
- (c) Article 2.13.7.2.2.4 determines that the ICA must certify seeds derived from improved materials to be made available to the public; and
- (d) The regulatory framework for Living Modified Organisms (LMOs) following the provisions of Law 740 of 2002, which approves the "Cartagena Protocol on Biosafety to the Convention on Biological Diversity", which applies to the transboundary movement, transit, handling, and use of LMOs that may have adverse effects on the environment and biological diversity, taking into account the risks to human health, productivity and agricultural production.

18. The ESMF considers risk mitigation measures for Activity 2.1, "Strengthening the germplasm bank, development of new varieties and massive multiplication of seeds for adaptation and mitigation. Seed multiplication techniques will be applied to outstanding varieties, facilitating a large-scale adoption of the varieties developed by the project". In the ESMF the AE identified that the impact of activity 2.1 could be introduction of genetically modified organisms which might have negative impacts on ecosystems and biodiversity (for example: crossing and/or genetic contamination of native species, competition with native species, loss of native species, development of more resistant pests, among others) and estimated this as high risk with a probability of 4 (within a score system of 5) and impact rate of 4. Three activities are planned for mitigation of this risk:

- (a) Regarding the introduction and management of genetically modified organisms, the project will comply with the corresponding regulations in relation to authorizations and permits, among others. In addition, great attention will be paid to interventions carried out in surrounding areas of moorland ecosystems, taking into account the guidelines of Law 1930 of 2018. This issue is of special attention for the potato value chain;
- (b) Carry out research and experimentation in controlled environments, in such a way as to avoid a possible negative impact on the species and ecosystems of the intervention areas; and
- (c) Carry out impact evaluations associated with the biosafety aspects of genetically modified organisms that are developed in the project in compliance with current regulations, and that involve the analysis of potential impacts on ecosystems.

As a result of these risk mitigation measures the risk downscaled to medium and the probability and impact are downrated to 2 and 3 respectively.

19. For activities 2.1 and 2.2 risk is assessed as high (5 score) for cases when genetically modified organisms could be used or high impact production practices developed in areas with moorland ecosystems. This risk should be given special attention in the potato and livestock value chains, among others. Mitigation measures have been planned and as a result the risk is

downscaled to moderate, and the probability and impact are downrated to 2 and 3 respectively. Mitigation measures planned are:

- (a) The project will comply with restrictions stated in the regulations, specifically in Law 1930 of 2018 article 5, which establishes prohibitions of some productive practices in moorlands such as: the use of heavy machinery in the development of agricultural activities; the final disposal, management and burning of solid and/or hazardous waste; the introduction and management of genetically modified organisms and invasive species; burning; logging; fumigation and spraying of chemicals should be gradually eliminated in activities of conversion of agricultural land into sustainable activities; and the degradation of native vegetation cover, among other practices, is prohibited;
  - (b) The project will not carry out activities within delimited moorland areas (there are 37 moorland complexes in Colombia). However, in case it is necessary within the scope of the project to provide assistance to producers located in those areas, the aforementioned prohibitions will be respected, and the project will promote the participation of those producers in training spaces that will inform about and promote the development of sustainable practices, which in turn will allow reduction of pressure on these ecosystems. As mentioned above, these measures need special attention in the potato and livestock value chains; and
  - (c) The Project Management Unit (environmental team), with support from the producer associations, will identify the male and female producers who carry out their productive activities in areas close/adjacent to delimited moorland ecosystems and will monitor the implementation of project activities developing sustainable agriculture practices. They will provide guidance and technical assistance for producers in these areas to participate in the activities proposed by the environmental authorities within the scope of Law 1930 of 2018.
20. The producer associations, CIAT, Agrosavia and MADR are responsible for monitoring activity 2.1 compliance with ESMF. Key groups for monitoring are: producers who have their crops in areas close to delimited moors; cattle breeders who have their livestock production activities in areas close to delimited moors; producers in areas near delimited moors that implement sustainable production practices; producers in areas near delimited moors that implement solid waste management practices.
21. In general, the monitoring schemes for all components are similar; the producer associations are the responsible entities for initial monthly and annual monitoring reports on risks and non-compliance with ESMF, and for providing details of corrective actions taken to reduce the impact of any difficulties, situations and/or problems encountered. Producer associations report to the Project Management Unit, which will report to the National Project Manager, CAF, and the MADR. Detailed performance criteria for monitoring are provided in the ESMF for all components. ICA is an entity within MADR and has the responsibility to legislate on sanitary, phytosanitary, production and inputs control issues.
22. The ESMF confirms that regarding the sustainable use of biodiversity and the management of genetically improved organisms, within the framework of the Convention on Biological Diversity, Colombia participated in the Cartagena Protocol on Biosafety<sup>9</sup> of in 2000, and approved through Law 740 of 2002. In 2010, the country participated in the Nagoya

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<sup>9</sup> The "Cartagena Protocol on Biosafety to the Convention on Biological Diversity" is an international treaty governing the movements of living modified organisms (LMOs) resulting from modern biotechnology from one country to another. It was adopted on 29 January 2000 as a supplementary agreement to the Convention on Biological Diversity and entered into force on 11 September 2003.

Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their use, which was approved through Law 1926 of 2018.<sup>10</sup>

23. The funding proposal contributes mainly to Sustainable Development Goal 2, “End hunger, achieve food security and improved nutrition and promote sustainable agriculture” and in particular to target 2.a, which aims to “increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries.”

24. The funding proposal could significantly contribute to the sustainable food security process though there are some risks which should be very closely monitored against any potential negative leakage. During an interview, the AE confirmed that the funding proposal mainly considers “conventional genetic improvements” and that “non- conventional genetically modified organisms” are not the part of the funding proposal. The independent TAP’s understanding is that there is no clear delineation between these two from the scientific point of view and as a result the ESMF attached to the project is quite detailed.

25. The independent TAP takes into consideration that GCF does not have a policy on genetically modified bioproducts and that Colombia is a member of Cartagena Dialog and has all necessary regulations and responsible bodies for monitoring and certification of genetic modification/improvement processes at national level and the criteria scored as medium to high. In addition, the independent TAP suggests a specific recommendation to the Board in case of approval of this funding proposal (see para 49).

#### 1.4 Needs of the recipient

*Scale: High*

26. The feasibility study describes everyday challenges faced by Colombia’s agriculture sector, by producers and gremios such as price issues and competitiveness, some with international market problems and others with respect to national markets. These challenges are exacerbated by climate change and weather-related losses. Colombia’s intended nationally determined contribution, among the priority activities to be implemented by 2030, considers ten agricultural subsectors such as rice, coffee, livestock and silvopastoral systems, with improved capabilities to adapt appropriately to climate change and climate variability.

27. There is a clear commitment in the agricultural sector to aim at the objectives proposed in the nationally determined contributions (NDC) for adaptation and mitigation of climate change in the sector, and at the same time a high degree of awareness of the importance of joining efforts between the different institutions of the private sector (gremios), public sector (MADR), research centres (Alliance of Biodiversity International and CIAT, Agrosavia, and crop research centres) to design a strategy that allows prioritizing and coordinating efficient actions aimed at concrete results in the coming years. A major barrier in Colombia has always been to bring all these institutions together towards a common goal.

28. The digitalization of agriculture should be considered as the future of this sector worldwide, including Colombia. The Colombian agricultural sector has seen a drastic drop in its share of the national economy in recent decades, from 22 per cent of GDP in the late 1970s to 6.0 per cent in 2015. In recent years, the sector has shown a slight recovery, with growth of 2.4 per cent and 2.3 per cent for 2018 and 2019 respectively. Areas identified as inhibiting faster development of the sector are:

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<sup>10</sup> The Nagoya Protocol is significant in terms of conservation of biodiversity, and for having an equitable sharing of benefits of the genetic resources. This is also intended to help indigenous peoples everywhere to avoid being exploited for their traditional knowledge and expertise.

- (a) Limited capacities of agricultural extension services and local farmers to collect, manage and systematize data to generate site- and time-specific advice for good management practices under climatic conditions induced by climate variability and change;
- (b) Limited access to and knowledge of genetic resources and their tolerance to climate variability and change by local farmers and producers;
- (c) Limited knowledge of water footprint and efficient water use technologies to promote behavioural changes that contribute to a better use of water resources, particularly under stress conditions;
- (d) Limited knowledge of carbon footprint at crop and technology level to promote large-scale adoption of low-emission practices;
- (e) Weak/vulnerable business models and lack of tailored financial instruments;
- (f) Weak extension services based on a linear model that provides blanket recommendations rather than site- and time-specific guidelines;
- (g) Limited knowledge of contributing factors to climate-smart agricultural technology uses and adoption by farmers in the targeted value chains;
- (h) Limited access to productive factors and participation in labour and decision-making processes by women and young farmers; and
- (i) Limited adoption of good practices to reduce environmental risks in at-risk areas (e.g. use of fertilizers).

29. Well-developed digital infrastructure for communication is a key element of the system promoted by the proposal. USAID's digital ecosystem assessment for Colombia highlights the need for investment and the potential for innovation in the country's rural areas. The funding proposal is in fact tapping into this potential for innovation and democratizing digitally enabled services for climate adaptation through leveraging private sector investment (from the gremios and the Government).

30. The independent TAP considers that needs of the recipient country are high and the GCF programme could be a significant contribution to narrowing most of the identified gaps through the activities, such as the establishment of tools for assessment of value chains of bio-businesses on sustainability including climate change resilience and low emissions, and strengthening crop resilience to climate change, to support start-up cases.

## 1.5 Country ownership

*Scale: High*

31. As was already highlighted above, this funding proposal is upscaling the national programme initiated by the Government of Colombia represented by the MADR in cooperation with the Alliance of Biodiversity International and CIAT via an agreement for technical and scientific cooperation. The four basic topics of agreement for mitigating climate change effects on Colombian farmers are detailed under the investment criteria "impact assessment".

32. The funding proposal has two executing entities: MADR and the International Center for Tropical Agriculture (CIAT), with MADR responsible for providing technical guidance for project implementation and supervising CIAT to ensure that all activities are executed on time and with the required quality to ensure the achievement of project results.

33. The Government of Colombia through the Ministry of Finance and Public Credit will be the entity responsible for project resources, both credit and grant resources from GCF, as well as CAF financing resources. The MADR will be responsible for executing the project resources and technical implementation through its Directorate of Innovation, Technological Development

and Health Protection.<sup>11</sup> The Government of Colombia will take loans from both GCF and CAF and will provide grants to the beneficiaries (gremios) given the public goods nature of the interventions. The MADR will be supported in the operation of this project by the Alliance of Biodiversity International and CIAT and the producer associations providing strong adherence to the legislation and regulations of the Government of Colombia. In addition, CIAT will develop a model agreement to be approved by the MADR that will be signed with each of the gremios, including the details of the activities, the co-financing provided by each gremio, and at the end of the project, commitments acquired for its continuity.

34. The project will have thirteen strategic local partners for project implementation, of which there are ten gremios and three research institutions. For the execution of the CSICAP project, CIAT will work in coordination with the following ten gremios: Fedearroz (rice), Fenalce (maize), Fedegan (livestock), Fedepanela (panela cane), Fedepapa (potato), Federación Nacional de Cafeteros - Cenicafe (coffee), Asocaña - Cenicaña (sugarcane), Augura, Asbama, and Aohofrucol (musaceae). Additionally, there are three research institutions as part of the strategic implementing partners: the Colombian Agricultural Research Corporation (Agrosavia), the International Maize and Wheat Improvement Center (CIMMYT) and the Center for Research on Sustainable Agricultural Production Systems (CIPAV) of Colombia. These strategic partners will have key roles in the implementation of project activities and therefore will be assigned a budget that will be subject to outputs and deliverables. The importance of these partner institutions lies in the fact that they will be responsible for the continuity and sustainability of the project actions once the project is completed.

35. The project has undergone a review by the Collegiate Body (made up of the Ministry of Environment and Sustainable Development, the Ministry of Finance and Public Credit, the Ministry of Foreign Affairs, the Presidential Agency for International Cooperation) which supports Colombia's national designated authority (NDA)<sup>12</sup> in decision-making and the funding proposal has incorporated the comments provided by the Collegiate Body. This process has verified the alignment of the project to the goals of the National Development Plan 2018–2022, the contribution to the strategies and goals of the National Climate Change Policy, the Green Growth Policy, and the Nationally Determined Contribution (NDC), as well as coverage at the municipal level (project scale), and other criteria aligned with the investment criteria of GCF.

36. According to the recently updated NDC, among Colombia's adaptation priorities for agriculture is improvement of capacities and information access to prioritized agricultural subsectors to adapt to climate variability and/or to climate change hazards. A priority for food security and poverty eradication is to ensure that 50 per cent of programmed actions for risk management, adaptation and climate change mitigation will be implemented by 2030. The funding proposal directly contributes to the achievement of the goals of the NDC, which are to strengthen ten producers' associations (gremios) by 2030, and to establish Agroclimatic Technical Work Groups in 27 departments, reaching one million users.

37. The proposed project is fully aligned with the relevant country strategies and policies. It is a part of Colombia's GCF country programme.

38. The exit strategy described in the funding proposal highlights country ownership through demonstrating clear roles for different stakeholders. The funding proposal informs that at the end of the project, the equipment and infrastructure developed by the it will continue to be in the name of MADR, but once the project is completed, they will be delivered to the gremios through a contract of bailment in which the gremios manage the assets and services (including data platforms) but undertake to give it proper use and assume maintenance costs and

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<sup>11</sup> Representing the Ministry before national and international instances related to research, technological development, innovation, agricultural technical assistance and health matters. Direction of Innovation, Technological Development and Health Protection ([minagricultura.gov.co](http://minagricultura.gov.co))

<sup>12</sup> In Colombia, the National Planning Department (DNP) is the national designated authority (NDA).

responsibility in compliance with national regulations. The funding proposal informs that this mechanism has been successfully used in several projects between MADR and the gremios, including the pilot project. A large part of the success of the pilot project lies in the strengthening of capacities and empowerment of the gremios (as in the case of Fedearroz and Fenalce in the pilot phase), which continued and expanded the work carried out with them.

39. The independent TAP considers that country ownership of the funding proposal and entire agriculture digitalization process is very high.

## 1.6 Efficiency and effectiveness

*Scale: Medium to high*

40. Total budget of the funding proposal is USD 99.91 million with USD 73.28 million (73.3 per cent) GCF share and the remaining 26.7 per cent is a country contribution. USD 25 million, 25 per cent of total and 34.1 per cent of the GCF share is grant. Of the total amount, 10.3 per cent is loan from CAF and 16 per cent (USD 16.33 million) is the grant co-financing from AGROSAVIA, CIAT and from nine producers' association. The fund mobilization ratio is 2.75:1. The independent TAP considers the ratio is efficient, considering that expected results are in the 'public goods' category.

41. Two key risk areas were identified by the independent TAP when reviewing the funding proposal: appropriateness of digital communication facilities for successful implementation of digital agriculture results; and monitoring of performance results through well-developed performance criteria. Significance of the results monitoring process in achievement of success is well recognized by the project proponents and the AE. One of the key findings when analysing the pilot phase (annex 23) was that weak horizontal penetration of information, knowledge, etc. was that monitoring of the 'last mile' was lacking, as was concluded by the funding proposal developers. The AE response on the issue of monitoring and evaluation of the pilot project was that it was not planned or considered at the time. Thus, timely information on the true impact of the project was not available and consequently the Government of Colombia, the gremios and the research centres were unable to react and adjust activities relevantly.

42. According to the funding proposal, initial monitoring is the responsibility of gremios but gremios should get information/data from producers and it should be very clear in the agreement that this is not a voluntary activity but a responsibility for both producers and, at later stage, for gremios. During the review, upon the request of the independent TAP, the AE provided an English translation of the template agreement between the Alliance and the gremios and a last-mile agreement between gremios and producers which were not in full satisfaction of the independent TAP. Later the AE provided relevantly revised template agreements.

43. Regarding the digital communication capacities in targeted regions, additional information was provided during the review that as of 2020, in terms of digital infrastructure, Colombia has 116 per cent mobile phone penetration and 77 per cent broadband penetration, though adoption and use are skewed toward urban centres. Some 73 per cent of people (72 per cent of females, 74 per cent of males) own a mobile phone, and 52 per cent of households have internet access at home. The digital divide is that only 16 per cent of rural households have internet at home compared to 63 per cent of urban households.

44. About 80 per cent of the intervention municipalities have (or are in the process of implementing) "Rural Digital Zones" implemented by the Ministry of Information, Technologies and Communications, which, since 2018, offers internet access with free connectivity 24 hours a day in areas with the highest concentration of the populated centres of municipalities. According to a Digital Ecosystem Assessment conducted by USAID, people in rural areas access internet outside their home, including at internet cafes, education centres, and public hotspots. Furthermore, the proportion of the rural population with at least a feature phone is far larger

than the proportion with a smartphone. In addition, CSICAP will work with a multi-pronged strategy using a variety of channels including voicemail (e.g. interactive voice response (IVR), short messaging system (SMS)), audio books, video, photos, text messages, chatbots/Wireless Application Protocol (WAP), TV, radio, some of which does not require internet and/or literacy.

45. Regarding the central system for improving the production of analytical information there are several government initiatives and funds focused on guaranteeing and maximizing access and service to information and communications technologies. At the same time CIAT counts on a data centre with the capacity to attend to most of the project demands. In addition, CIAT has access to BIOS (the highest performance computers in Colombia) through the RENATA academic network.

46. From the AE's response during the review, the independent TAP understood that implementation of offline systems and asynchronous communication tools are envisaged, as an interim measure. This will allow the project in the field to synchronise or upload the information once there is network availability. The independent TAP considers that this kind of off-line communication might not be effective, and additional measures should be considered (e.g. individual meetings in villages, etc.) to effectively bring necessary information to the final customers/producers who could significantly increase the final efficiency of project.

47. The strength of the funding proposal is partnership. The funding proposal and feasibility study highlight that a major barrier in Colombia has always been bringing together all these institutions working towards a common goal. The importance of these partners lies in the fact that they are the institutions that will be responsible for the continuity and sustainability of the project activities once the project is completed. This should guarantee the high efficiency and effectiveness of this programme.

48. The independent TAP recognises all the challenges of the project and scores the effectiveness and efficiency potential of the funding proposal as medium to high.

## **II. Overall remarks from the independent Technical Advisory Panel**

49. The independent TAP recommends this funding proposal for approval by the GCF Board and recommends that the Secretariat establish a special monitoring regime for the implementation of ESMF commitments and establish periodic reporting to the Board on this issue.

## Response from the accredited entity to the independent Technical Advisory Panel's assessment (FP182)

Proposal name:	Climate-smart initiatives for climate change adaptation and sustainability in prioritized agricultural production systems in Colombia (CSICAP)
Accredited entity:	Corporación Andina de Fomento (CAF)
Country/(ies):	Colombia
Programme/programme size:	Medium

### Impact potential

*CSICAP considers from its formulation the direct work and massive involvement of producers as a response to the lessons learned from the pilot. Components 1 and 2 of the CSICAP project consider massive implementation of technologies on producers' farms. CSICAP is including a whole component (component 3) aimed exclusively at strengthening the vertical dissemination of technologies. The producers' associations/ gremios and Agrosavia will allocate personnel and resources to promote the vertical dissemination of the technologies promoted by CSICAP. The CSICAP project is placing a strong emphasis on vertical dissemination for which a high potential for impact is expected.*

### Paradigm shift potential

*No comments*

### Sustainable development potential

*CSICAP will not use genetically modified organisms. The Project (activities component 2) will use only conventional genetic improvements. It is worth noting that the methods for plant improvement are divided into "conventional" and "genetic modified (GM)", both aim to produce a crop with traits to improve the performance of the crop. However, GM achieves this through adding new genes from other or the same species (transgenic, cisgenic), inducing recombination with the agrobacterium mechanism. The conventional genetic improvement is the development of cultivars based on the mode of reproduction of the species (cross pollination, self-pollination or clonally propagation)<sup>1</sup>.*

<sup>1</sup> Additional reference about it: (i) <https://royalsociety.org/topics-policy/projects/gm-plants/how-does-gm-differ-from-conventional-plant-breeding/>; (ii) Acquah, G. (2015). Conventional Plant Breeding Principles and Techniques. In J. M. Al-Khayri, S. M. Jain, & D. V Johnson (Eds.), (iii) Advances in Plant Breeding Strategies: Breeding, Biotechnology and Molecular Tools (pp. 115–158). Springer International Publishing. [https://doi.org/10.1007/978-3-319-22521-0\\_5](https://doi.org/10.1007/978-3-319-22521-0_5)

**Needs of the recipient**

*No comments*

**Country ownership**

*No comments*

**Efficiency and effectiveness**

*CSICAP seeks to modernize, empower, and enhance the capacities of the existing extension services, and in all cases (i.e. for all producers' organizations) the offline systems and asynchronous communication tools will be a complement to direct work with the farmers through focus groups, farm visits, and in field individual meetings in local areas. The use of online and offline systems and asynchronous communication tools is a strategy to scale up the arrival to additional producers of information on adaptation and mitigation measures and achieve greater efficiency in extension systems and achieve greater impact.*

**Overall remarks from the independent Technical Advisory Panel:**

*As mentioned before in the section of "Sustainable development potential", the CSICAP project (activities under component 2) will not work with genetically modified organisms and will only use conventional methods of genetic improvement. In this sense, the ITAP recommendation about "that the secretariat establish special monitoring regime for the implementation of ESMF commitments and establish periodic reporting to the Board" is based on the premise of the use of genetically modified organisms, which is not correct. We respectfully suggest that the recommendation should be reconsidered.*

## Gender documentation for FP182

 <p>CORPORACIÓN <b>BioParque</b> Por el desarrollo sostenible</p>	Social, Gender and Environmental study of the Project CSICAP* in Colombia	
	Gender Assessment presented to: The Alliance of Bioversity International and CIAT	Date: 03/31/2021
		Deliverable No. 4

# GENDER ASSESSMENT

**CSICAP** All the references in this document have been changed to **CSICAP**. If there is any reference to **CSICAP** should be understand as **CSICAP\***

**\* The initial title of the project was changed from Low-Emission and Climate Resilient Agriculture in Colombia (LECRA) to Climate-smart initiatives for climate change adaptation and sustainability in prioritized agricultural production systems in Colombia (CSICAP). All the references in this document have been changed to CSICAP. If there is any reference to CSICAP should be understand as CSICAP**

**Annex 8 – Part A**

Green Climate Fund Funding Proposal



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## Introduction

The following gender assessment is an input for the formulation of the project “Low Emission and Climate Resilient Agriculture” (CSICAP, for its acronym in English). This Project seeks to improve the capacity of eight agricultural production chains (rice, corn, potato, cattle, banana, panela and sugarcane, and coffee) to mitigate their respective greenhouse gas emissions and adapt to climate change by increasing efficiency in the use of the natural resources and production.

In recent years, the agricultural activities associated with these eight products have been affected by variability in temperature and rainfall, with more frequent and intense floods, droughts, and frosts, which have sometimes led to crop losses. Besides, some agricultural and livestock practices have contributed to soil degradation. As a result, productive cycles have been altered and land-use conflicts have increased, compromising the resilience and sustainability of production. This in turn increases the economic vulnerability of male and female producers and puts food availability at risk.

These events may have differential repercussions depending on the characteristics of the territory and its communities (men and women, or ethnic groups), as well as the type of producers (small, medium, or large), due to the unequal access to productive factors, information technologies and the mechanisms for adapting to climate change. In the case of rural women, the effects of climate change are exacerbated by the gender norms relations in the household and on the farm. The low participation in production decision-making, low access to and control over land and financial and technological resources, overburdened domestic and unpaid care work, and low income and high levels of poverty (especially among female heads of household), among other facts, limit the women’s capacity to develop adaptation strategies in the face of climate variability. Besides, the effects on household food security may deepen because, on the one hand, the responsibility for food supply falls on them, and, on the other hand, climate change may decrease the availability of water, food, and resources for self-consumption.

Specifically, in rural areas of the country, where 5,8 million men and 5,2 million women live, there are differences in the socio-demographic conditions of the population. According to DANE figures (2020), even though the number of people of working age is similar regardless of gender (in the working ages, between 10 and 59 years, the percentage is similar, 67.9%, and in the older ages slightly higher participation of men than women is identified: 13.1% and 12.7% respectively), participation in the labor market evidence significant gender gaps: the 73.8% of rural men are employed, compared to 36.8% of women. In addition, the rural female unemployment rate is higher than that of men (9.6% and 3.0% respectively), which shows the greater restrictions faced by women in developing activities included in the System of National Accounts. This situation results in a lower capacity of rural women to generate income and, therefore, in a higher percentage of monetary poverty (35,0% of rural female-headed households are in this condition, compared to 27.9% of male-headed households).

These gender gaps evidence structural causes that limit the equitable development of rural women and men and their communities. On the one hand, according to the National Time Use

Survey -ENUT (2016-2017), women perform most of the unpaid work in rural areas: they spend approximately 8 hours a day on these tasks, compared to 3 hours spent by men. On the other hand, according to the 2014 National Agricultural Census, only in 38.6% of the Agricultural Production Units in the country, do women participate in decision-making on production. Furthermore, as will be shown in the following chapters, women producers have less access to productive assets such as land, technical assistance, and credit.

Within this framework, the main objective of the Gender Assessment is to provide a baseline for recognizing the initial social, economic, and environmental conditions of the CSICAP Project, with emphasis on identifying social and gender gaps in male and female producers in the prioritized chains. The purpose of this is to generate inputs so that social inclusion and gender approaches are considered in the formulation of the Project, so that CSICAP not only avoids deepening of the gaps identified but also contributes to the transformation of the causes that generate these inequities.

This Gender Assessment was obtained from mixed research methods and triangulation of secondary information (on norms and policies) and statistical information, mainly instruments (census and surveys) of the National Administrative Department of Statistics, with primary information. The latter included the completion by the associations of an institutional capacity analysis form, as well as the development of interviews and group sessions with association officials, extensionists, affiliated female and male producers, and institutional actors.

As a result, the Gender Assessment makes a comprehensive diagnosis with a gender perspective of the territories, population, and productive chains targeted by the CSICAP Project, as well as the institutional, regulatory, and policy framework. To this end, the document is organized into four chapters.

The first chapter presents a general diagnosis of the social and gender conditions of the territories prioritized by the CSICAP Project, which includes demographic, age, and household headship characteristics and identifies gender gaps concerning to indicators of poverty, education, labor market, income, and use of time in paid and domestic work and unpaid care activities.

The second chapter characterizes the prioritized production chains, identifies gender gaps, and comprehensively analyzes different aspects that determine the success of including a gender approach in a climate-resilient agriculture program (Beuchelt & Badstue, 2013): the social conditions of male and female producers, and their access to and control over productive assets. Meanwhile, the third chapter analyzes the institutional capacities of the respective associations to manage gender issues.

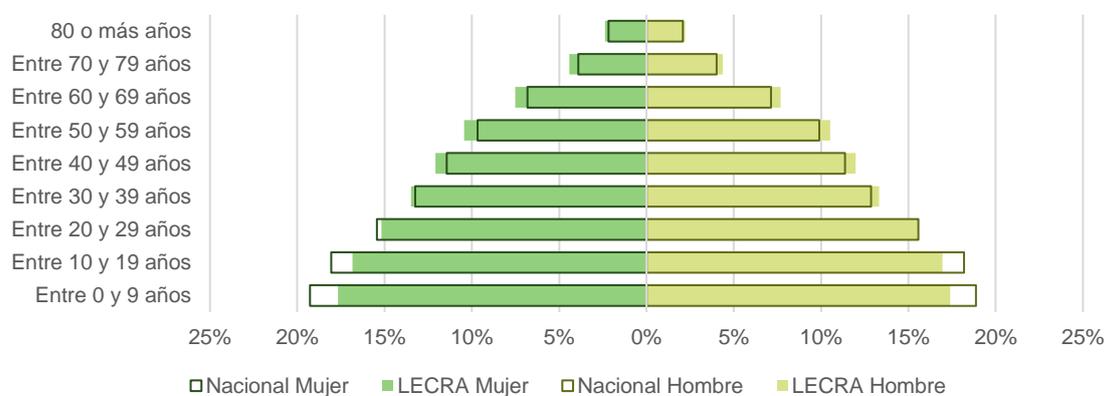
The fourth and last chapter defines the institutional and gender policy framework, which refers to the main international norms adopted by Colombia, as well as those established at the national level for the promotion of equity for women, especially those living in rural areas. Similarly, it mentions the main policies and programs in force that have been formulated and

implemented by the national government to promote equity for rural women and analyzes the institutional capacities of the entities involved in this process.

## 1. Population characterization with a gender perspective

According to DANE figures (2020a), the territories where the CSICAP<sup>1</sup> Project will be implemented have a rural population of 2,99 million people, of which 51.8% (1,55 million) are men and 48.2% (1,44 million) are women. Regarding the distribution of this population by age groups, Graph 0.1 shows a progressive behavior in the population pyramid of the rural inhabitants of the Project municipalities, as well as that of the country<sup>2</sup> country as a whole. This is related to greater participation of children under 10 years of age and a relatively homogeneous reduction for each of the age groups. Additionally, when comparing the composition of the CSICAP municipalities regarding the national data, there is lower participation of those under 20 years of age (34.4%, which is 2,7 percentage points lower than the national situation) and higher participation those over 40 years of age. However, given that the decrease is relatively homogeneous—among each of the groups— in these municipalities it is not possible to identify a population loss, specifically, in initial working ages (between 20 and 29 years old) as it is presented in the national context, which goes from participation of 18.1% to 15.5% (for the population between 10 and 19 years, and between 20 and 29 years old, respectively)

**Graph 0.1. Population pyramid. Rural area. CSICAP municipalities and rural national. 2020**



Source: Prepared by the authors based on DANE (2020a)

Regarding the participation of men and women in decision-making within households, of the 941,5 thousand households in the CSICAP municipalities, 7 out of 10 are headed by men, which is higher than the situation in rural areas of the country (68.9%) (graph 0.2). Further, only 26.0%

<sup>1</sup> The departments selected for the implementation of the chains are as follows:

**Rice:** Antioquia, Casanare, Cesar, Córdoba, Huila, La Guajira, Magdalena, Meta, Norte de Santander, Sucre Tolima, Valle del Cauca. Risaralda, Santander, Tolima y Valle del Cauca.

**Banana:** Antioquia, Cesar, La Guajira y Magdalena.

**Sugarcane:** Antioquia, Boyacá, Caldas, Caquetá, Cauca, Cundinamarca, Huila, Nariño, Norte de Santander y Quindío,

**Corn:** Antioquia, Cesar, Córdoba, Huila, La Guajira, Meta, Quindío, Risaralda, Santander y Tolima.

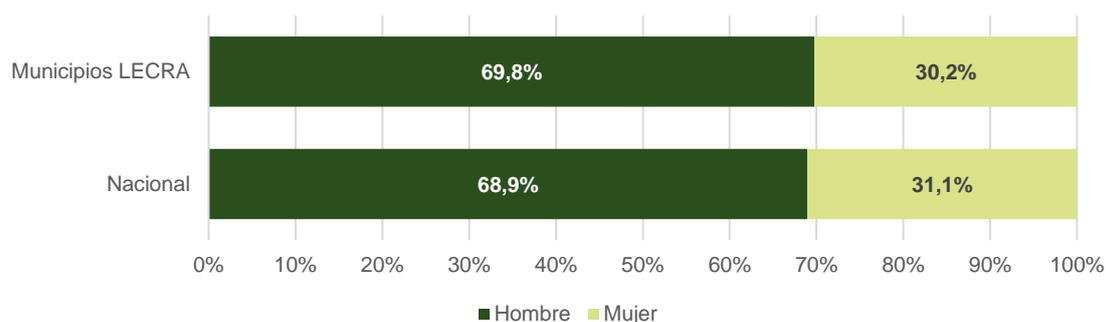
**Potato:** Antioquia, Bogotá, Boyacá, Caldas, Cauca, Cundinamarca, Nariño, Norte de Santander, Santander, Tolima y Valle del Cauca.

**Cattle:** Antioquia, Arauca, Caquetá, Cauca, La Guajira, Meta, Nariño, Santander y Sucre.

<sup>2</sup> The population of the municipalities of the CSICAP project are represented in the graph with filled bars; while the national rural information is shown in the bars without filling and with dark outline.

of female-headed households live with a spouse, while 33.9% of female-heads of household are single, 24.9% are widowed, and 24.1% are separated (common-law or married). This reflects that in most of these households, women are the head of household, which increases the household's risk of falling into poverty since women earn less income than men to support their dependents. In contrast, 72.0% of male-headed households live with their spouse, 40.4% of male heads of household are in a union, and 30.6% are married.

**Graph 0.2. Sex of the head of household. Rural area. CSICAP municipalities and rural national. 2018**



Source: Prepared by the authors based on DANE (2020b)

Now, from Social Conpes 150 of 2012, the Multidimensional Poverty Index was defined to establish the absence of desired social conditions of households and individuals, by identifying simultaneous deficiencies in the dimensions of educational conditions of the household<sup>3</sup>, conditions of children and youth<sup>4</sup>, work<sup>5</sup>, health<sup>6</sup> and household services and housing<sup>7</sup> conditions.

In view of the above, and based on DANE (2020c), it is identified that, of the 10,38 million rural people in the CSICAP<sup>8</sup> departments, 3,47 million are in a condition of multidimensional poverty, corresponding to 33.5%, a figure lower than the national situation (34.5%). To capture territorial differences, Map 1 presents the adjusted MPI calculated by DANE from the 2018 National Population and Housing Census. It shows that 47.3% of the municipalities prioritized by the CSICAP project have multidimensional poverty incidence rates between 40% and 60% and the overall average is 43.4%. Most of the country's municipalities with the highest levels of rural poverty (above 60%) are not part of the project, and the average adjusted rural MPI for the rest of the municipalities is estimated at 54.0%. Therefore, in terms of poverty conditions, the prioritized municipalities are in a better situation compared with the rest of the country's rural territory.

<sup>3</sup> The educational conditions of the household are analyzed in terms of low educational achievement and illiteracy.

<sup>4</sup> The conditions of children and youth are analyzed based on school absenteeism, school lag, barriers to access to early childhood care services, and child labor.

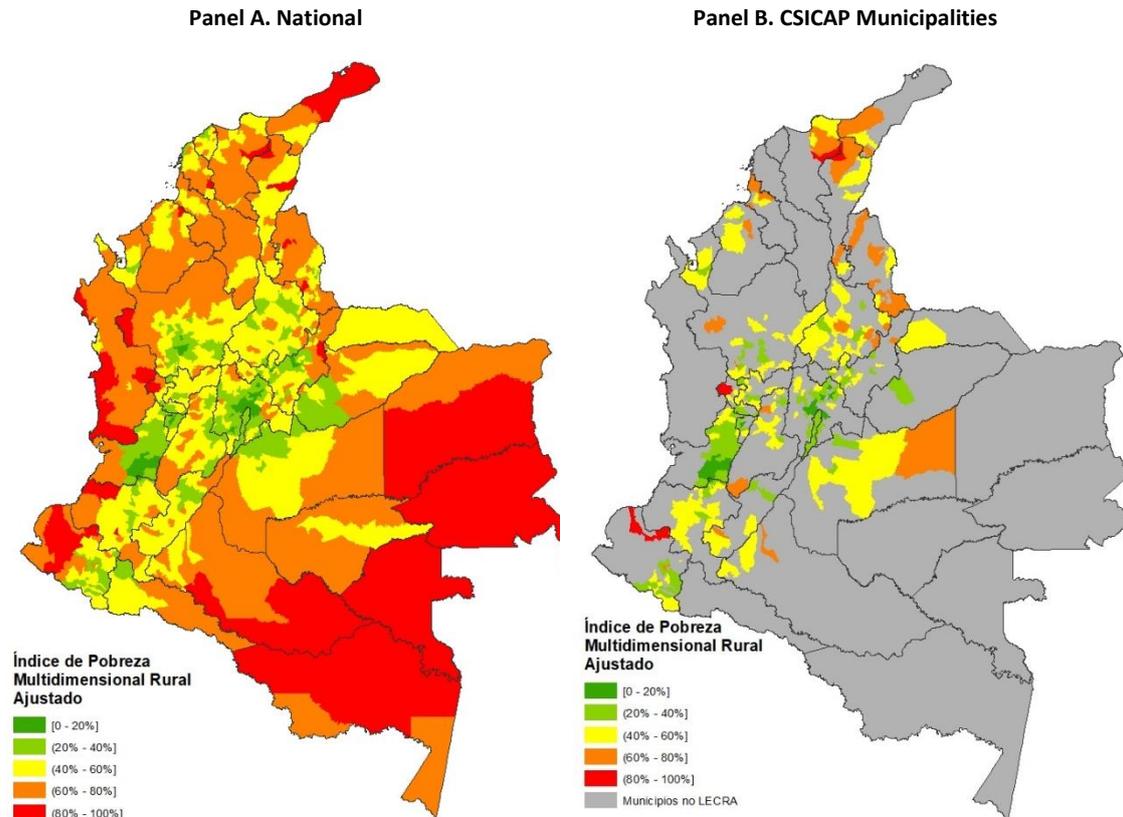
<sup>5</sup> Labor conditions are analyzed based on long-term unemployment and informal employment.

<sup>6</sup> Health conditions are analyzed through health insurance and barriers to access to health services.

<sup>7</sup> Public services and housing conditions are analyzed based on access to an improved water source, inadequate excreta disposal, inadequate floors, inadequate exterior walls, and critical overcrowding.

<sup>8</sup> A CSICAP department is one that has at least one municipality to intervene in the project.

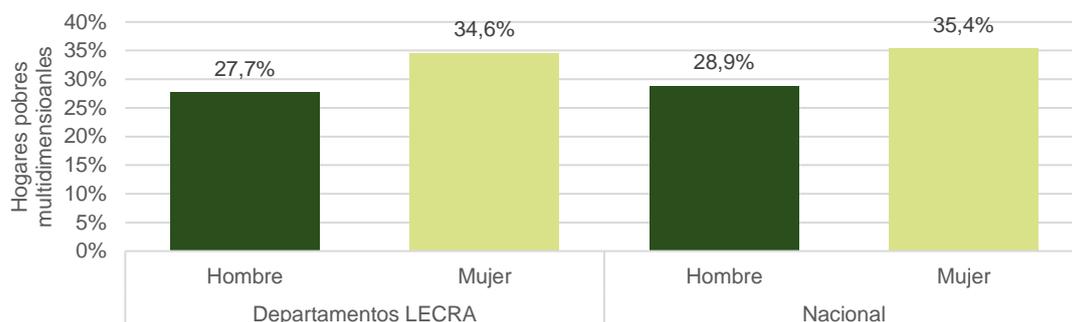
Map 1. Adjusted Rural Multidimensional Poverty Index. 2018



Source: Prepared by the authors based on DANE (2020)

Regarding poverty status according to the gender of the head of household, graph 0.3 shows that 34.6% of the rural female-headed households are considered multidimensional poor, compared to 27.7% of male-headed households. The main deprivations affecting female-headed households correspond to informal work (91.9%), low educational attainment (75.5%), limited access to an improved water source (38.5%), and school lag (32.9%). However, when compared to male-headed households, there is a large difference in long-lasting unemployment (6.6% for male-headed households and 21.8% for female-headed households), which reflects the restrictions on women's entry into the labor market.

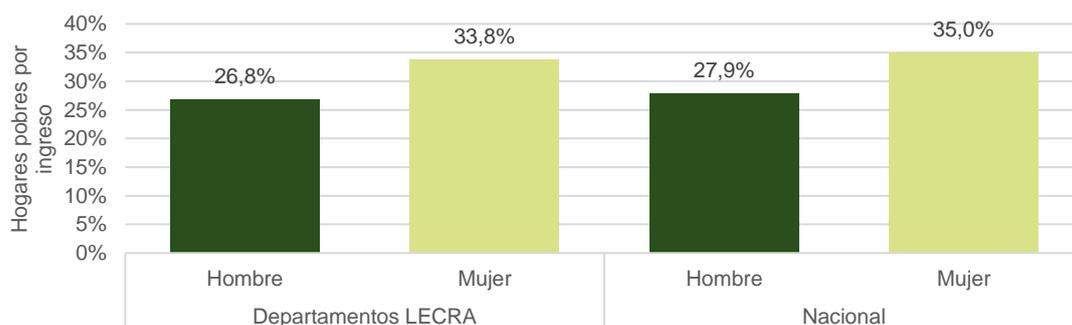
**Graph 0.3. Percentage of households living in multidimensional poverty according to the sex of the head of household. Rural area. CSICAP department and rural national. 2019**



Source: Prepared by the authors based on DANE (2020c)

Similarly, when analyzing the condition of monetary poverty, which represents the percentage of people who do not have enough per capita income to cover the basic basket of goods and services, it is identified that in the CSICAP departments, 34.6% of the rural population faces this situation, which is lower than the national rural poverty rate (36.1%). Additionally, based on DANE (2019) it is estimated that of the 2,1 million rural households headed by men, 26.8% are income poor, which is below the 33.8% of poor households headed by women (673,8 thousand households). This situation is explained by the lower income-generating capacity of female-headed households (with an income of 959,8 thousand, in contrast to 1,1 million male-headed households).

**Graph 1.4. Percentage of households in monetary poverty according to the sex of the head of household. Rural area. CSICAP department and rural national. 2018**

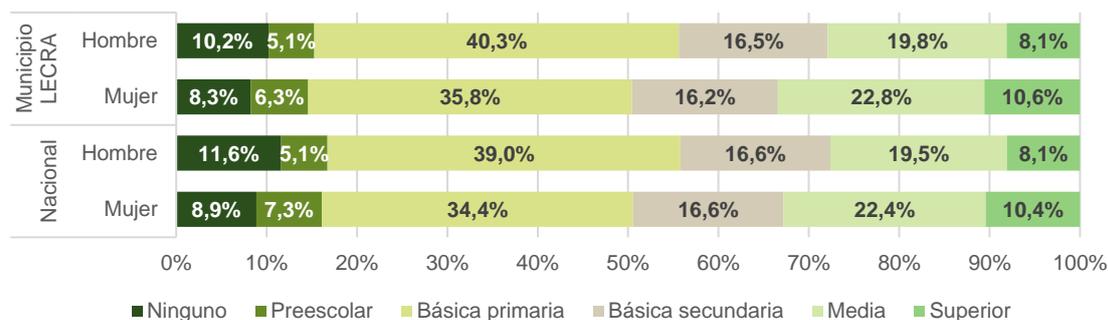


Source: Prepared by the authors based on DANE (2019)

Therefore, the gender gaps, both in the quality of life (represented by multidimensional poverty) and in the capacity to generate income (monetary poverty), are evidence of the feminization of poverty in rural areas of the country and the CSICAP departments. Regarding the educational conditions of the rural population, DANE (2020B) identifies that of the 2,0 million people over 15 years of age living in the CSICAP municipalities, 12.1% do not know how to read or write. This rate is lower than the national rural rate (11.9%), and it is similar between men and women (12.2% and 12.0% respectively). When analyzing educational levels by gender, women have

higher levels of education than men: 22.8% have high school education and 10.6% have higher education; while 19.8% of men have vocational secondary education and 8.1% have higher education. However, more than 50% of the population does not have basic secondary education, showing strong restrictions for the accumulation of human capital in rural areas of the country.

**Graph 1.5. The educational level attained by sex. Rural area. Over 15 years of age. CSICAP municipalities and rural national. 2018**

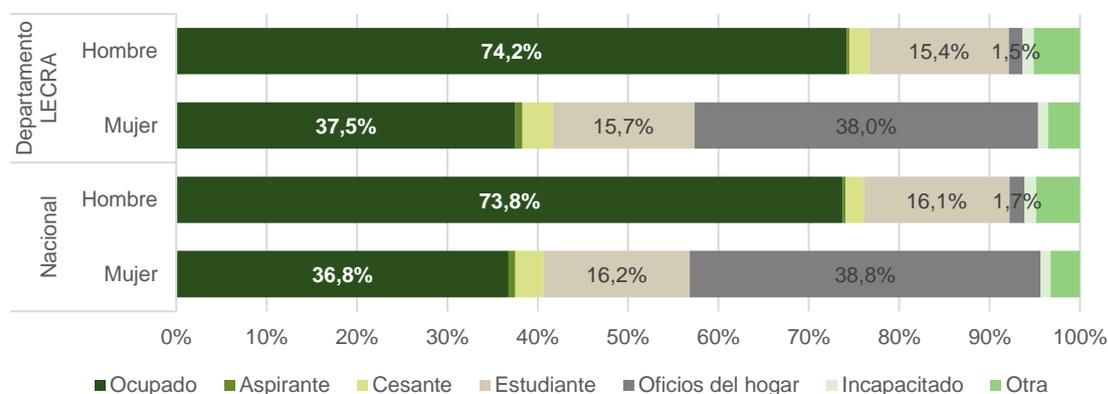


Source: Prepared by the authors based on DANE (2020b)

In terms of the labor market, the population that is part of the labor force totals 7,7 million for the CSICAP departments, of which 57.1% are employed and 18.6% are employed in household occupations. When analyzing activity according to sex (graph 0.4), there are large differences between men and women: while 74.2% of men are considered employed, for women this figure does not exceed 37.5%. In addition, 38.0% of the female population is employed in household occupations, while the participation of men is barely 1.5%.

These figures reflect that, even though rural women have on average a higher level of education than men, care services in rural areas fall on women and limit their labor participation, which has an impact on their limited capacity to generate income, affecting their economic empowerment.

**Graph 0.4. Labor force activity by sex. Rural area. CSICAP departments and rural national. 2018**

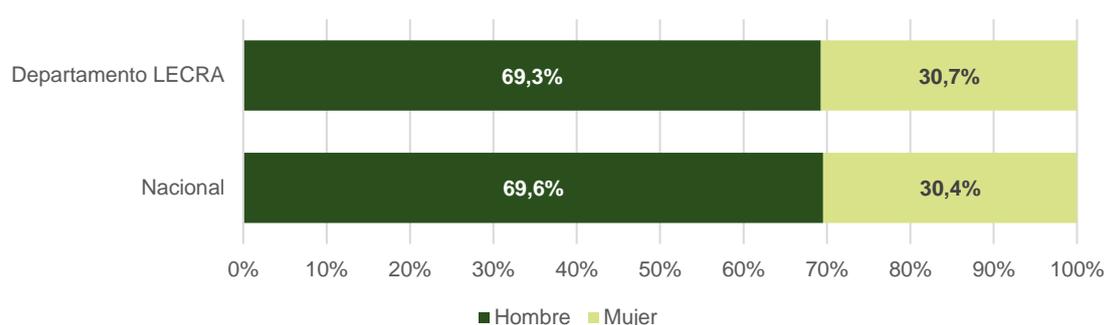


Source: Prepared by the authors based on DANE (2019)

Also, in the CSICAP departments, 69.3% of those employed are men and 30.7% are women (

graph 0.5). This shows the preponderance of men in the development of productive activities in rural areas, both in these departments and at the national level. Additionally, there are large differences between the incomes earned by men and women in the agricultural sector. Specifically, in the agriculture, livestock, and hunting subsector, men's average income corresponds to 74.5% of the current legal monthly minimum wage (smmlv<sup>9</sup> for its acronym in Spanish), while women's average income is 33.5% of 1 smmlv. When analyzing these data according to the occupational position, it is identified that employees earn the highest labor income (131% of 1 smmlv for men and 106% for women), followed by the employer (129% for men and 98,2% for women), day laborers (99% for men and 64% for women), and, finally, self-employed workers, who earn the lowest income in the sector (57% of 1 smmlv for men and 34% for women)

**Graph 0.5. Percentage of employed by sex. Rural area. CSICAP departments and rural national. 2018**

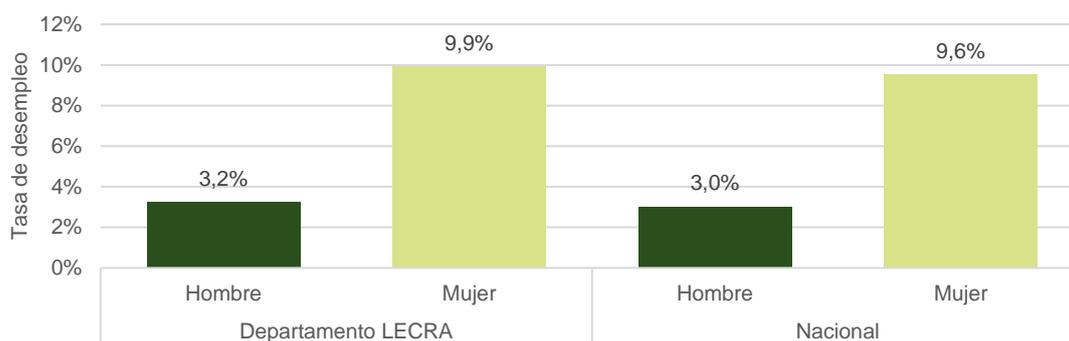


Source: Prepared by the authors based on DANE (2019)

However, identifying the unemployment rate shows that while men have an unemployment rate of 3.2% in the CSICAP departments, the rate for women is 9.9% (similar to the national rate). Therefore, the labor market in rural areas does not manage to absorb the supply of women's jobs. This situation is related to the structure of the rural economy, where agricultural and livestock activities predominate, in which male paid labor prevails. Nevertheless, rural women participate in these tasks as unpaid family workers and care economy activities closely related to agricultural production, such as the production, transformation, and supply of food for self-consumption and day laborers, and animal care.

<sup>9</sup> This is the minimum legally established payment that a person receives per month for their work, it is currently 908.526 COP in Colombia.

**Graph 0.6. Unemployment rate by sex. Rural are. CSICAP departments and rural national. 2018**



Source: Prepared by the authors based on DANE (2019)

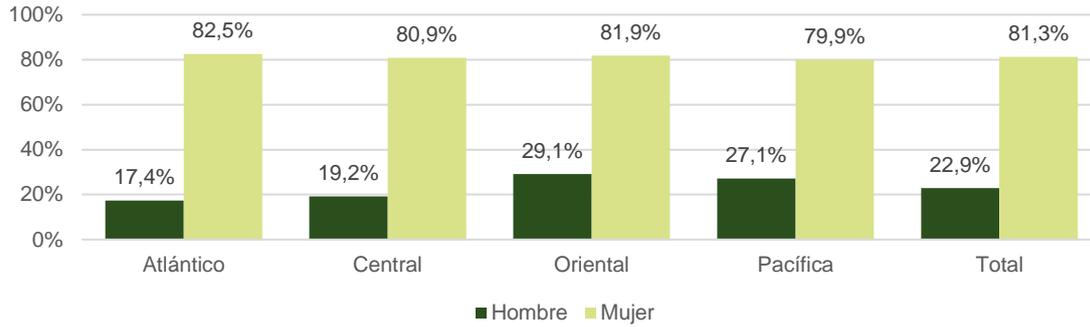
In this sense, and thanks to Law 1413 of 2013, the importance of unpaid work performed at home that is not usually accounted for (housing maintenance, care of household or community members, and maintenance of the paid labor force) is recognized, and the role of rural women in the economic and social development of their communities is beginning to become evident. In this regard, 37.1% of rural women carry out activities included in the System of National Accounts (SNA) with a daily destination of 4:50 hours, and 92.5% carry out activities not included in the SNA for 07:52 hours. On the other hand, 65.5% of men perform SNA activities (8:25 hours) and 60.5% perform non-SNA activities (3:06 hours). In other words, women work more hours per day than men (12:42 hours vs 11:31 hours, respectively), but approximately two-thirds of them are spent on domestic and unpaid care activities, while men spend less than one-third of their working time on these activities.

Among the work activities not included in the System of National Accounts are: i) providing food to household members; ii) maintaining clothing for household members; iii) cleaning, maintenance, and repairs for the household; iv) household purchases and administration; v) care activities with children under 5 years of age belonging to the household; vi) support for household members; and vii) passive care (being on standby). The gender gaps in each of these areas are presented below.

First, concerning to providing food to members of the household<sup>10</sup> (preparing and serving food; lifting and washing dishes at home; preparing canned food, cheese or sausages; or taking food to people at their place of work or study), in rural areas of the country, 22.9% of men perform these activities compared to 81.3% of women (graph 0.7). The regions with the greatest differences are the Atlantic region (17.4% of men and 82.5% of women) and the Central region (19.2% of men and 80.9% of women). On the other hand, the Eastern and Pacific regions show higher participation of men (29.1% and 27.1% respectively).

<sup>10</sup> Since the CSICAP Project will be implemented in all regions, a disaggregated description is provided for each region.

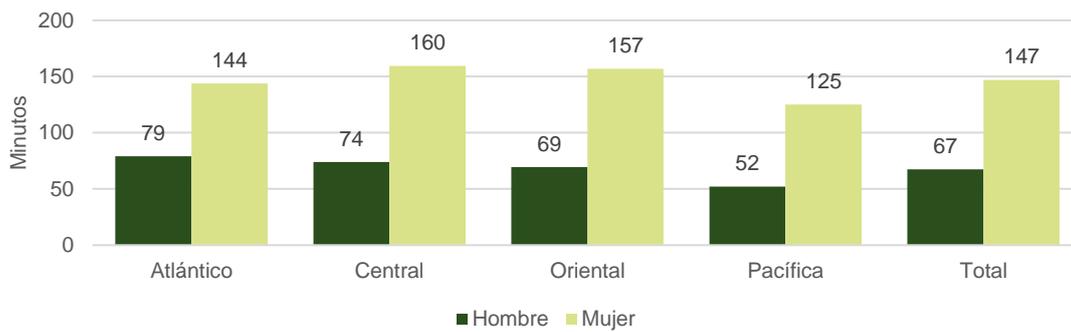
**Graph 0.7. Participation in activities of supplies to household members by sex and region. 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

graph 0.8 also shows the time rural men and women spend on these activities: men spend 67 minutes on these activities, while women more than double this figure with 147 minutes. The region with the lowest time spent in the Pacific region (52 minutes for men and 125 minutes for women), while in the Central region men spend 74 minutes and women 160 minutes.

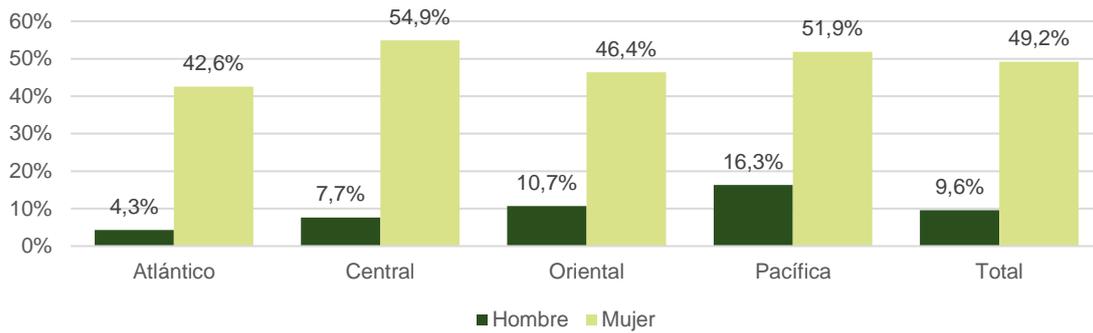
**Graph 0.8. Time spent in activities of supplies to household members by sex and region. 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

Second, concerning the participation in clothing maintenance (washing, ironing, or putting away the clothes from household members; repairing clothes, tablecloths, blankets, footwear, suitcases; making clothes; and taking or picking up clothes from the laundry), only 9.6% of rural men perform these activities, compared to 49.2% of women (graph 0.9). Similarly, food supply shows that the Atlantic region is the one where men perform these activities the least, with 4.3%; women’s participation is 42.6%. On the other hand, the Pacific region is the one where the maintenance of clothing presents the highest participation of men with 16.3% and 51.9% of women.

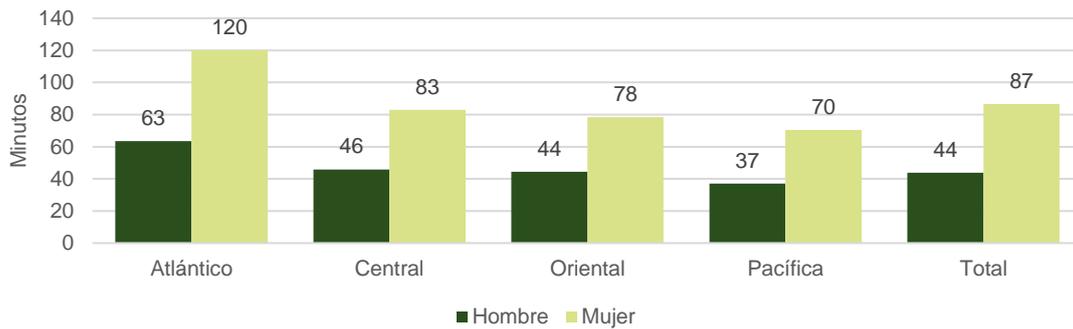
**Graph 0.9. Participation in wardrobe maintenance activities of household members by sex and region. 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

Regarding the time allocated to these activities, on average, rural men spend 44 minutes and women spend twice as much, 87 minutes (graph 0.10). Although the participation of men in the Atlantic region is low, the time allocated is the highest with 63 minutes, and women spend 120 minutes. On the other hand, the Pacific region shows lower periods with 37 minutes for men and 70 minutes for women.

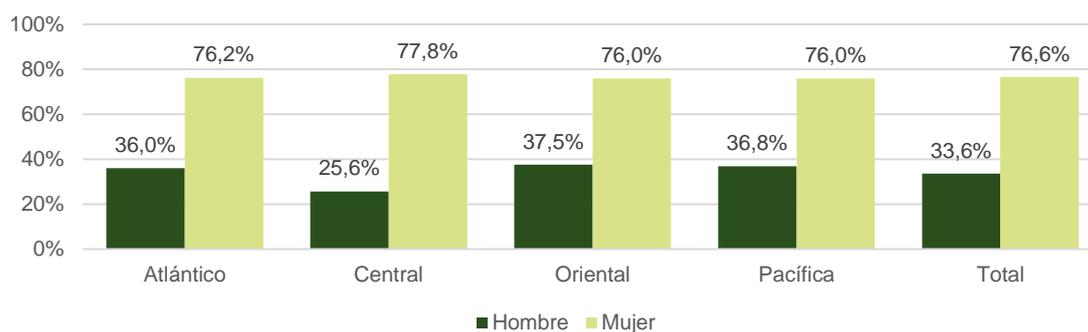
**Graph 0.10. Time spent on wardrobe maintenance activities of household members by sex and region. 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

Thirdly, regarding the participation in household cleaning and maintenance (corresponding to cleaning the house, caring for pets and the garden, cleaning vehicles, fetching water or fuel for cooking at home), 33.6% of men living in rural areas carry out these activities compared to 76.6% of rural women (graph 0.11). The greatest difference according to the sex of the person is in the Central zone where 25.6% of men and 77.8% of women perform some of the actions for household cleaning and maintenance. In the Atlantic, Eastern, and Pacific regions, the behavior is similar. The smallest difference is in the Eastern region with 37.5% of men and 76.0% of women.

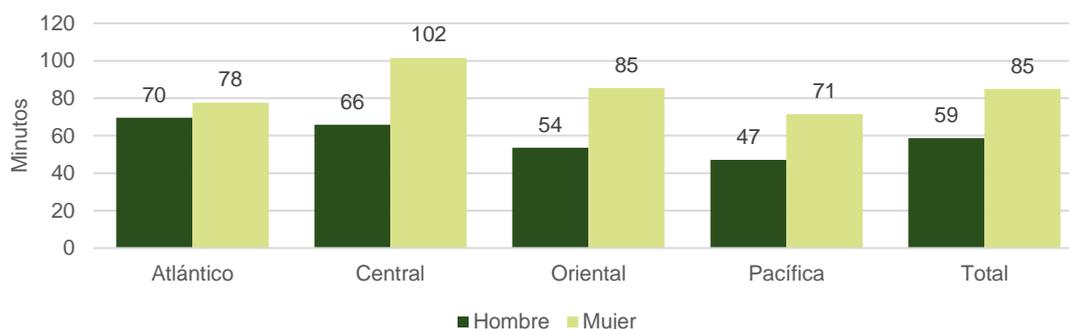
**Graph 0.11. Participation in household cleaning and maintenance activities by sex and region. 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

Similarly, graph 0.12 shows how people spend their time on these activities. On average, men spend 59 minutes and women 85 minutes. The Pacific region is the one where both men and women spend the least amount of time, with 47 minutes for men and 71 minutes for women. The Central region shows the greatest difference in participation and in time as well, with men spending 66 minutes and women 102 minutes.

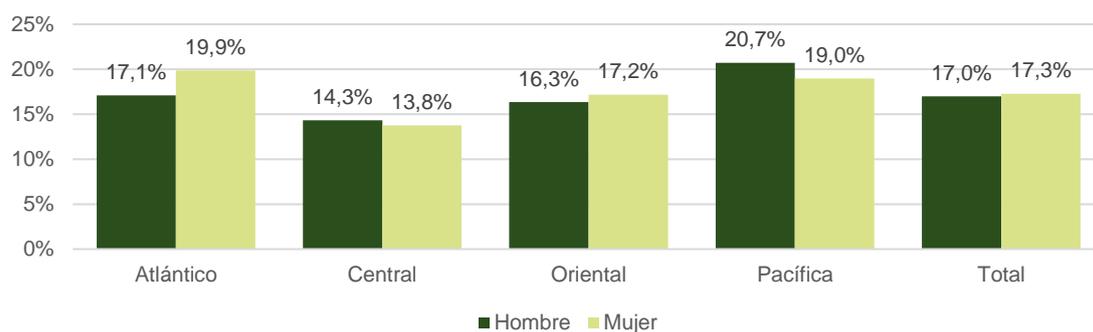
**Graph 0.12. Time spent on household cleaning and maintenance activities by sex and region. 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

Fourth, concerning the participation in household purchasing and administration activities (purchasing personal items, buying or claiming medicines, directing or supervising household activities, paying bills, looking for housing to rent or buy, collecting subsidies for someone, or moving to carry out one of the activities), the percentage of men and women who carry out these activities is similar (17.0% and 17.3% respectively) (graph 0.13). The region with the greatest difference is the Atlantic region, where 17.1% of men and 19.9% of women engage in purchasing and management activities. It is worth mentioning the Pacific region, since 20.7% of men report carrying out these activities, while the participation of women is 19.0%.

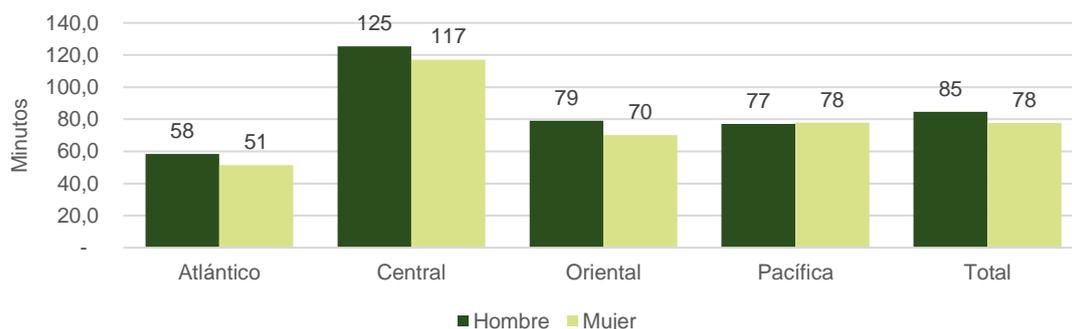
**Graph 0.13. Participation in shopping and household management activities by sex and region. 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

Likewise, the time spent by the population is similar, as shown in graph 0.14, with men spending 85 minutes and women 78 minutes. By region, the Central region has the longest time spent, with 125 minutes for men and 117 minutes for women. On the other hand, the Pacific region- despite not being the region that spends the least time- is the one with the greatest similarity between the two sexes (77 minutes for men and 78 minutes for women).

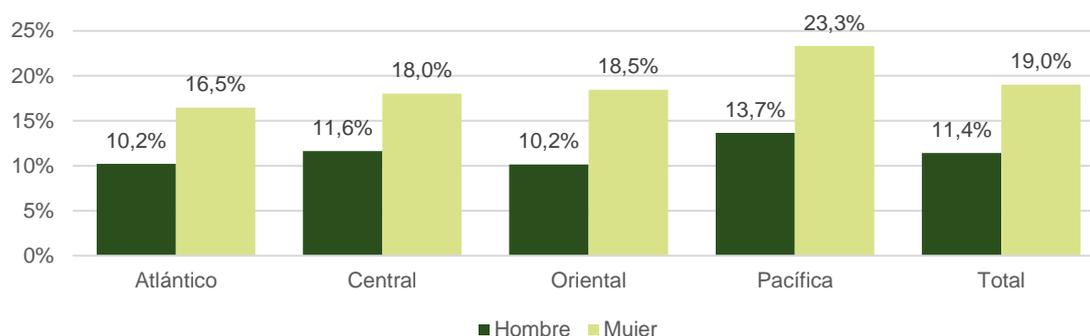
**Graph 0.14. Time spent on shopping household and management activities by sex and region. 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

In fifth place, graph 0.15 shows participation in activities with children under 5 years of age in the household (such as playing, telling, or reading stories, or taking them to the park), according to which 11.4% of men and 19.0% of women carry out caregiving activities. The highest participation is found in the Pacific region, with 13.7% of men and 23.3% of women. The Atlantic region has the lowest percentage (10.2% of men and 16.5% of women).

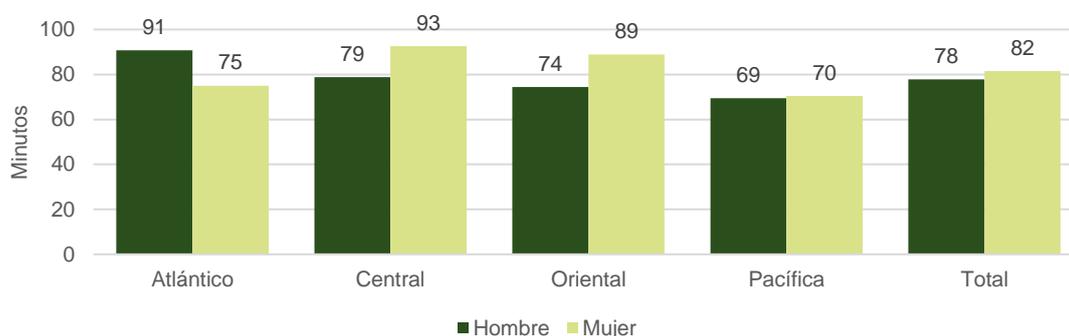
**Graph 0.15. Participation in activities with children under 5 years of age in the household by sex and region. 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

In terms of time spent on this activity, women spend an average of 82 minutes and men 78 minutes. Nevertheless, regional differences are evident: in the Atlantic region, the time spent by men is 91 minutes, while for women it is 75 minutes. In the Central and Eastern regions, the additional time spent by women is around 15 minutes. In the Pacific region, the time spent by both sexes is homogeneous.

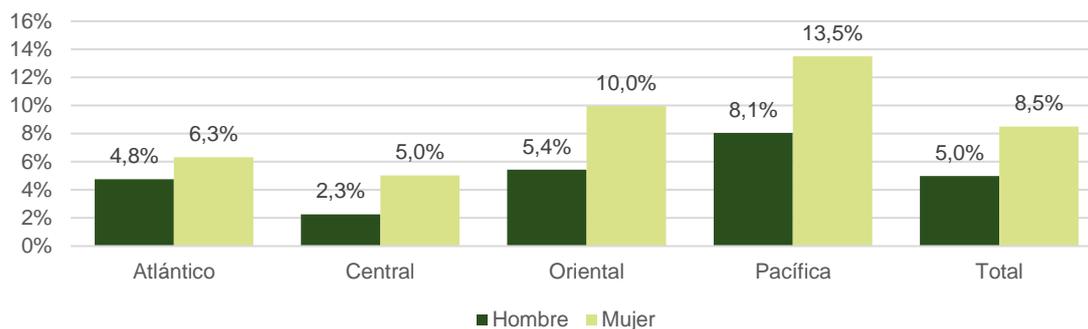
**Graph 0.16. Time spent in activities with children under 5 years of age in the household by sex and region. 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

Sixth, 8.2% of women and 5.0% of men perform support activities for household members (taking or bringing minor and those over 12 years of age to their place of study or work, or taking people from the household to social, cultural, or recreational events) (graph 0.17). In the case of the Central region, the number of people who perform these activities is low (2.3% of men and 5.0% of women), while in the Pacific region it is more common (13.5% of women and 8.1% of men).

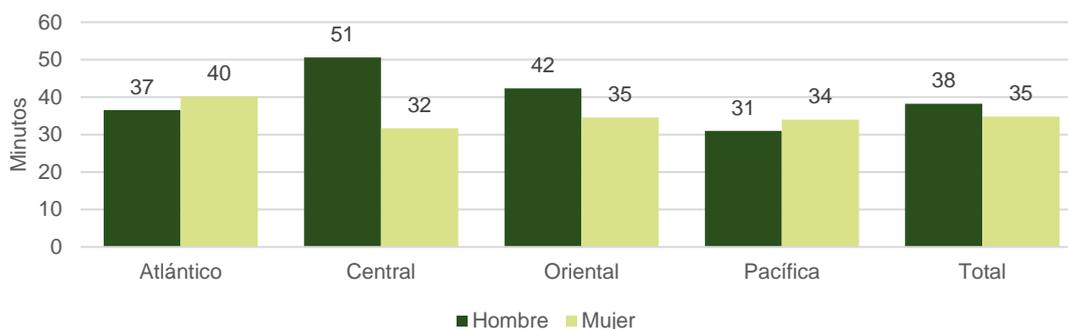
**Graph 0.17. Participation in activities supporting household members by sex and region. 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

In terms of time spent, rural men spend about 38 minutes and women 35 minutes (graph 0.18). Likewise, in the case of the Atlantic, Eastern and Pacific regions, there is homogeneity in the time spent by individuals. In the Central region, however, there is a significant difference between the sexes, with men spending 51 minutes and women 32 minutes.

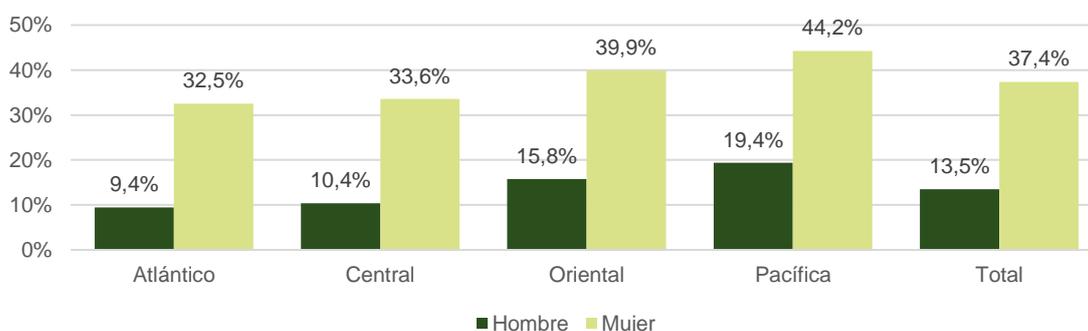
**Graph 0.18. Participation in activities supporting household members by sex and region. 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

Finally, taking care of other members of the household is an activity carried out mainly by women (37.4%) (graph 0.19). The gender gap is similar for the Atlantic and Central regions, where women's participation is close to 33% and men's is 10%. The Pacific region is the one with the highest participation rates (19.4% of men and 44.2% of women).

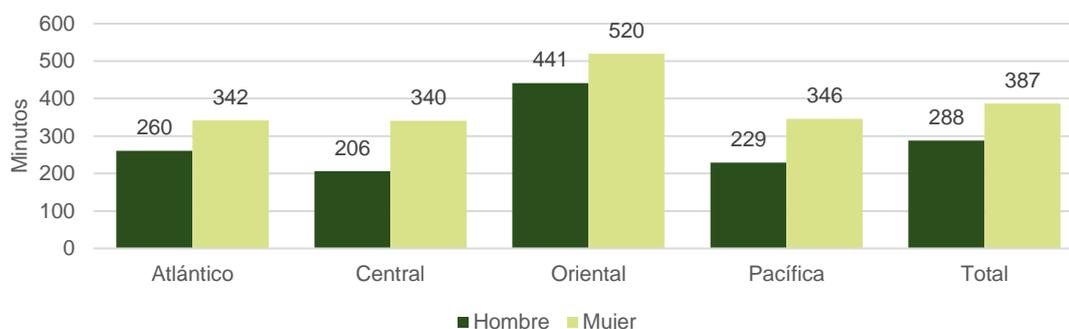
**Graph 0.19. Participation in activities of taking care of household members by sex and region. 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

It is worth noting that this activity is the one that shows the greatest dedication of time for both men and women. As shown in Graph 1.22, women spend 387 minutes on passive caregiving and men 288 minutes. In the Eastern region, women spend 520 minutes and men 441 minutes. Meanwhile, the region that spends the least time is the Central region with 340 and 206 minutes for women and men, respectively.

**Graph 0.20. Time spent in activities of taking care of household members by sex and region 2016-2017**



Source: Prepared by the authors based on DANE (2016-2017)

## 2. Characterization of production chains from a gender perspective

This chapter analyzes the production conditions, from a gender and ethnic perspective, in each of the prioritized chains: rice, bananas, coffee, panela cane, sugarcane, cattle, corn, and potatoes.

In general, issues and problems, both general and specific to each production chain, are summarized in Table 2.1 and must be considered in the Gender Action Plan and the Project's Environmental and Social Management Framework, following the guidelines dictated by the regulations and policies on equity for women described in the following chapter.

**Table 0.1. Summary of production conditions by sex of the producer and production chain**

Component	Sex of the producer	Rice	Banana	Coffee	Sugarcane	Panela Cane	Potato	Corn	Cattle
Decision-making	Men	55,1%	71,8%	58,2%	54,4%	55,3%	53,5%	64,7%	63,8%
	Women	17,7%	8,8%	20,0%	24,8%	23,1%	18,6%	16,9%	18,3%
	Mixed*	11,0%	13,7%	15,5%	18,4%	11,1%	16,0%	7,8%	22,4%
Average size of the UPA (estate.)	Men	40,6 ha	16,0 ha	15,0 ha	6,0 ha	7,2 ha	7,7 ha	30,6 ha	72,7 ha
	Women	27,6 ha	29,9 ha	8,4 ha	3,2 ha	4,5 ha	4,3 ha	18,4 ha	29,5 ha
	Mixed	28,6 ha	10,5 ha	10,9 ha	5,2 ha	7,7 ha	7,2 ha	38,9 ha	22,0 ha
Access to technical assistance	Men	25,8%	61,5%	61,9%	59,3%	35,5%	15,3%	21,9%	16,7%
	Women	20,4%	55,9%	56,1%	51,0%	27,5%	9,8%	16,1%	16,2%
	Mixed	33,9%	37,2%	62,0%	57,3%	43,6%	25,2%	23,7%	34,8%
Access to credit	Men	18,6%	6,6%	18,9%	14,5%	18,2%	24,1%	14,6%	16,9%
	Women	11,9%	7,5%	16,3%	10,5%	15,1%	19,3%	13,6%	18,3%
	Mixed	27,9%	4,8%	24,2%	20,1%	19,7%	36,6%	14,4%	37,7%
Access to information and communication technologies	Men	72,4%	77,3%	60,2%	59,9%	60,9%	59,6%	76,7%	61,1%
	Women	81,9%	89,6%	65,9%	60,0%	66,9%	66,2%	84,4%	65,2%
	Mixed	83,1%	97,3%	81,3%	81,2%	81,5%	81,2%	86,3%	80,6%

<b>Earned income</b>	Men	Average income for the agriculture, livestock and hunting subsector: 74.5% of the current legal monthly minimum wage. Average income of employee 131% of the smmlv, employer 129% of the smmlv, day laborer 99% of the smmlv and self-employed 57% of the smmlv.
	Women	Average income for the agriculture, livestock and hunting subsector: 33.5% of the current legal monthly minimum wage. Average income of employee 106% of the smmlv, employer 98% of the smmlv, day laborer 64% of the smmlv and self-employed 34% of the smmlv.

\*Note: Mixed refers to agricultural production units (APU) in which men and women participate jointly in decision-making.

Source: Prepared by the authors.

Among the elements of the diagnosis, it should be noted that, in general, social norms, gender stereotypes, and patriarchal relations, among others, have normalized the fact that domestic work and unpaid care work are activities that fall on rural women, which considerably limits their participation in labor and decision-making in agricultural production units. On average, women participate considerably less in decision-making in production units, at 18.5% compared to 59.6% for men. The banana, corn, rice, livestock, and potato chains have the lowest proportion of production units headed by women (less than 20% and, in the case of bananas, the figure does not exceed 10%)

Similarly, in terms of access to land, the size of production units in the municipalities prioritized for the CSICAP project is higher than the national average. However, the analysis revealed gender gaps not only about land ownership but also concerning size, where on average the size of the land owned by women producers corresponds to 72.9% of the size of the land owned by men (the greatest differences are found mainly in the cattle chain, where it is only 41%).

Production factors, such as access to technical assistance and credit, condition access to other production factors, considerably limit the production possibilities of women farmers and ranchers. This is the case, for example, of potato producers who receive technical assistance, of whom only 9.8% are women. In the corn and livestock chains, women account for 16% of the producers receiving assistance. In the rice and sugarcane chains, this percentage is between 20% and 30%, while in the banana, coffee, and sugarcane chains, it is between 50% and 60%. In addition, regarding the management of production systems and technical assistance, including the topics taught through this service, there are some differences in behavior according to the sex of the producers. This reflects the importance of working in a participatory way with the different beneficiaries of the CSICAP project and, in this process, incorporating the gender approach.

Regarding the access to credit, less than 20%-regardless of the crop- were able to receive some method of financing for production. Besides, except for bananas and livestock, the gender gap in access to credit persists among male and female producers in the other chains.

Therefore, the figures show that, in general, there is less access to productive factors by female producers who make production decisions on their own. This situation has repercussions on rural women's ability to generate income. Indeed, not only is the income received by farmers and ranchers in the country significantly low, but the gender gap is also quite wide: while men earn, on average, 74.5% of the current legal monthly minimum wage (smmlv), the figure for women is no more than 33.5%. Furthermore, the data show that the income gap is present in all occupations (employee, employer, day laborer, and self-employed).

This situation, added to the greater vulnerability and poverty levels of rural women who are heads of household (35.0% of female-headed households are in monetary poverty and 35.4% in multidimensional poverty, and 27.9% of male-headed households are in monetary poverty, and 28.9% in multidimensional poverty), makes this population group one that requires special attention to help close gender gaps.

Concerning ethnic groups, most of the ones that have a presence in the prioritized municipalities are indigenous. It was also identified that the participation of women and mixed producers tends to be higher in ethnic groups, especially in indigenous groups. To access productive factors and management practices of productive systems, wide gaps were identified according to ethnicity. In addition, peasant producers and those belonging to ethnic groups currently implement production and conservation practices that are culturally rooted, several of which should be recognized and incorporated into the CSICAP project to generate trust and at the same time promote appropriation and social construction of knowledge. To the above is added the low digital connectivity of the territories participating in the Project and the fact that the changes entail economic risks that may be difficult for small producers to manage. These and other factors put at risk the adoption by the beneficiaries of the knowledge, technology, practices, and models that are expected to be disseminated through CSICAP.

It is also important to note the demographic pressure on the Colombian countryside, which is not foreign to the municipalities where the CSICAP project will be implemented. In all the chains studied, the majority (over 64%) of producers are over 60 years of age (**iError! No se encuentra el origen de la referencia.**). This imposes challenges, not only in terms of promoting change, adopting knowledge and new technologies, and the communication and implementation methods used with these users.

**Table 2.2. Percentage of producers over 60 years of age in the prioritized municipalities by the production chain**

Productive chain	% of producers over 60 years old
Rice	80,2%
Banana	68,2%
Sugarcane	64,4%
Panela cane	79,4%
Potato	79,7%
Corn	71,7%
Cattle	67,2%

Source: Prepared by the authors

### 3. Capacities of the Producer Associations to manage gender issues

About the capacities of the nine Producer Associations participating in the CSICAP Project to manage gender issues, most of the entities do not have institutionalized channels, instruments, and resources to promote gender equity; however, some practices and projects developed with rural women demonstrate an interest in incorporating these issues. In general, it is essential to strengthening the capacities of these entities to guarantee the implementation of the Gender

Action Plan of the CSICAP Project, as well as the sustainability of its results in the long term. The following are the main conclusions regarding the institutional capacities of each guild.

Producer Associations such as Fenalce, Asocaña, Fedepapa, and Fedearroz have not implemented policies and do not have a gender action plan. This has impacted the functioning of the strategic plans and follow-up tools since no guideline allows observing the differentiated needs of both women and producers belonging to ethnic communities. However, despite not having a gender policy, it is important to highlight that Fedepapa has 68.2% of female workers within the guild, and 40% of its extensionists are women. Concerning this, Fedepapa is the only union with these figures. On the other hand, Fedearroz and Asozaña, despite having salary equity policies, do not meet with affirmative measures to improve the access of female producers to agricultural extension activities, and therefore the efforts made to establish inter-institutional links to promote programs or projects that benefit female members are not included in the institutional plan established by the unions, which may prove to impede the recurrence of this type of projects. In other words, the lack of a general framework on equity and gender does not guarantee the sustainability of these actions or their harmonization with objectives to close gaps in the long term.

Regarding the inclusion of the differential approach, Producer Associations such as Fenalce and Fedearroz have not established policies to promote projects, programs, or policies to encourage the participation of ethnic communities belonging to their respective production chains. This is shown in the percentages of people on the board of directors, the project formulation teams, and the absence of areas whose function is to address issues related to the differential and gender approach. It may be that many of these affirmative actions are seen as a form of discrimination by the associations, as mentioned in some of the interviews. Therefore, the idea is that "equity" means providing all members with the same opportunities, without recognizing the different difficulties that vulnerable populations may have in accessing them.

On the other hand, Producer Associations with impact in regions with a high presence of ethnic communities have consolidated efforts to integrate differential approaches into the internal processes of the guild, such as Fedepapa, which has carried out activities or projects aimed at improving the conditions of ethnic producers in the chain. This has been possible because they have disaggregated information on their members since they have membership forms that specify different aspects of the producers, which allows for a detailed record of the associated population and their production conditions.

Equally, unions such as Fenalce, Asocaña, Fedepapa, and Fedearroz scored below 40% in the financial capacity component with a gender perspective. This may be due mainly to the lack of a gender equity policy or a differential approach to recognize the importance of having budgetary markers associated with the affirmative actions that are carried out. The involvement of women in production processes requires not only differentiated technical assistance but also access to credit and an institutional budget for this purpose, as a way of establishing a commitment from the guild to women and supporting their projects within the chain. In addition to the monitoring, follow-up, and evaluation component, these associations do not have information on the number of women extensionists, people from ethnic communities, or the number of women members. The lack of disaggregated information on the people working in

the Producer Associations or associated producers is a flaw since it does not provide relevant information for the design of projects, programs, and labor-union policies with a differential approach.

On the other hand, Producer Associations such as Fedenapela, ASBAMA, and the National Federation of Coffee Growers (FNC) were characterized for having high scores regarding the components with a differential and gender approach. These Producer Associations have an action plan or gender policies that are applied to strategic plans and follow-up tools, and therefore have policies to promote equity and affirmative measures, and in the cases of ASBAMA and the FNC, articulation, and financing processes have been carried out to benefit women producers and ethnic communities that participate in the production chain. In the same way, the last two mentioned Producer Associations have disaggregated information on aspects such as the percentage of women members and the number of women working in the institution, although they omit information on the ethnic component. However, and despite the above, ASBAMA does not have regulations to promote participation regarding the inclusion of women on boards of directors and decision-making bodies, and Fedepanela does not have a budget designated for affirmative actions for female and male producers belonging to ethnic communities.

Finally, the only guild that did not respond to the section referring to aspects related to the differential approach was Fedegan; however, from the qualitative work, it was evident that the importance of women within the production chain is recognized. To ensure this commitment to sustainable actions, it is necessary to implement specific policies and guidelines to promote equity and non-discrimination. About inter-institutional articulation processes, although no response was obtained, the interviews referred to projects developed in alliance with international actors, in which work was carried out with women ranchers, in some cases victims of the armed conflict.

## **4. Regulatory and gender policy framework of CSICAP Project**

### **4.1 International Instruments**

Concerning gender equity and the guarantee of rights of women, Colombia has signed and ratified important international instruments. First, it is worth mentioning the 1979 Convention on the Elimination of All Forms of Discrimination against Women - CEDAW (approved by Colombia through Law 51 of 1981), which confirmed the country's commitment to the pursuit of gender equality and the definition of relevant measures to achieve it.

Additionally, the country has participated in different international forums, such as the First International Conference on Women (Mexico, 1975), where the Decade for Women plan was signed; the Second World Conference on Women (Copenhagen, 1980), which emphasized the elimination of violence against women; the Third World Conference on Women (Nairobi, 1985); and the Fourth World Conference on Women (Beijing, 1995), which established a platform of action for the rights of women.

The above-mentioned conventions and conferences share the characteristic of recognizing the link between gender inequalities and the disproportionate effects of climate change on women, raising awareness of the need to adopt measures that are consistent with this situation and that improve the quality of life of women, while at the same time adopting measures to protect and restore ecosystems.

Likewise, there are regional platforms in which Colombia has participated, such as the Convention on the Prevention, Punishment, and Eradication of Violence against Women (Convention of Belém do Pará), which was ratified by Law 248 of 1995 and creates a regional instrument for the recognition of the full and free exercise of civil, political, economic, social, and cultural rights of women. Also, the Tenth Regional Conference on Women in Latin America and the Caribbean, organized by ECLAC, appeals to States to guarantee the participation of rural, indigenous, and Afro-descendant women in political life and paid work.

Moreover, the Colombian government has signed a series of United Nations resolutions that are related to the quality of life of women, their role in the development, and their political participation: Resolution 66/216 (2012) and Resolution 66/130 (2012). Particularly, Resolutions 62/136 (2008) and 64/140 (2009) are aimed at improving the situation of women in rural areas.

Recently, the country has aligned itself with the Sustainable Development Goals (SDGs) as a reference point for the formulation of public policy in the country. In particular, SDG 5 refers to gender equality, with a special emphasis on vulnerable women, such as rural women. Besides, other goals such as climate action, underwater life, and terrestrial ecosystem life can be addressed from a gender perspective.

## 4.2 National regulations and public policy

There are two main groups of gender equity regulations at the national level: one focused on the protection of the rights of women and the other with special emphasis on rural women, their productive inclusion, and, in general, on creating tools for gender equity in rural areas of the country.

Among the main laws that protect women's rights are Article 43 of the 1991 Political Constitution, which guarantees equal rights and opportunities between men and women; Law 823 of 2003, which dictates norms on equal opportunities for women; Law 1232 of 2008, which defines female head of household; Law 1257 of 2008, which adopts norms to guarantee women lives free of violence; and Law 1413 of 2010, or the Care Economy Law, which includes the care economy in the National Accounts System.

Regarding the participation of women in decision-making spaces, Law 581 of 2000, or the Quota Law, establishes minimum participation of 30% of women in public decision-making positions and calls for the adoption of similar measures in the private sector and civil society. This law has become a reference framework for the establishment of affirmative measures related to the minimum participation of women in government programs, for example, those related to productive projects.

In 2013, through document CONPES 161, the National Public Policy on Gender Equity was adopted, to contribute to guarantee the full enjoyment of the rights of Colombian women. To this end, it promotes the mainstreaming of the gender approach in all sectors of the economy, giving special attention to rural women.

Law 731 of 2002, or the Rural Women's Law, aims to improve the quality of rural women and prioritizes low-income rural women. This is based on the definition of affirmative and favourable measures related to, among other aspects, i) access to financing (from which the Credit Line for Low-Income Rural Women was created), ii) the titling of agrarian reform lands equitably for women and their spouses, and iii) participation (of at least 30%) in reforestation and environmental recovery projects. Thirteen years after the disclosure of this law, Decree 2369 of 2015 was signed, creating the Directorate of Rural Women in the Ministry of Agriculture and Rural Development, responsible for ensuring the welfare of rural women.

On women's right to land ownership, there are several norms. Decree-Law 902 of 2017 establishes the joint titling of vacant and fiscal patrimonial lands for spouses or permanent partners and recognizes care activities as activities for the use of rural lands for land adjudication. In turn, Law 1900 establishes that the Family Agricultural Units on vacant land will be awarded to spouses or permanent partners. Additionally, MADR Resolution 311 of 2019, which regulates Law 1900 of 2018, establishes prioritization criteria for rural women for the adjudication of vacant, based on their conditions of poverty and marginality. Besides, Resolution 12096 of 2019 and Agreement 0058 of 2018 of the National Land Agency, establish criteria related to the care economy, the female head of household, and belonging to women's organizations to prioritize women in the processes of access and formalization to land ownership.

Similarly, Law 1448 of 2011 or Victims Law established that women have special protection from the State in procedures associated with land restitution, such as preferential access to credit, training, and social security programs.

It is also worth mentioning that, regarding productive activities, Article 8 of Law 1900 of 2018 establishes that the gender approach must be included and guarantee priority access to rural women, especially those who are heads of household, to the different funds, plans, and programs related to productive projects of the Ministry of Agriculture and Rural Development and other entities that favor rural activity. Similarly, for productive projects, the aforementioned article recognizes the activities of care and unpaid domestic work as rural activities. In the same sense, the Regulations of the Comprehensive Agricultural and Rural Development Projects (PIDAR for its acronym in Spanish) of the Rural Development Agency, adopted by Agreement 010 of 2019, amended by Agreement 004 of 2020, establishes that rural women are part of the five population groups subject to differential attention.

In terms of agricultural extension, Law 1876 of 2017 created the National Agricultural Innovation System (SNIA for its acronym in Spanish) and defines the public agricultural extension service as a service with a differential approach that, among other aspects, will ensure comprehensive assistance that includes the sustainable management of natural resources and the promotion of practices for mitigating and adapting to climate change. In this context, the law establishes

affirmative and favorable measures for rural women, such as their prioritization as beneficiaries of the subsidy for the public agricultural extension service fee, the promotion of the development of organizations of female producers, and their participation in the SNIA's Superior Council through a rural woman representative.

Another important norm regarding the welfare of rural women is Resolution 464 of 2017 on public policy guidelines for Peasant, Family and Community Agriculture (ACFC for its acronym in Spanish), which recognizes the fundamental role of rural women in the ACFC, which constitutes 75% of the country's Agricultural Units.

Moreover, the Bases of the National Development Plan (PND for its acronym in Spanish) 2018-2022, throughout Chapter XIV presents the Pact for the Equity of Women, whose objective is the creation of a National System of Women and the creation of the National Care System, through the Intersectoral Commission of the Care System, recognizing the need for differential policies for rural women. Furthermore, the PND 2018-2022 is a pioneer in the creation of a budget tracer for the equity of women, which seeks that all public entities that receive resources from the General Budget of the Nation have identified their investments and commitments to close the gaps between men and women, both in investment and operation.

In line with the roadmap established in the PND 2018-2022, state strategies to address rural women and their needs have been promoted and implemented by entities at the national public level, such as the Ministry of Agriculture and Rural Development, with the leadership of its Directorate for Rural Women, as well as the National Land Agency (ANT for its acronym in Spanish) and the Rural Development Agency (ADR for its acronym in Spanish), and, in some cases, with the help of international cooperation and other civil society organizations. These strategies have been developed under the 2013 National Public Policy on Gender Equity for Women, whose six main axes are: 1) Peacebuilding and cultural transformation; 2) Economic autonomy and access to assets; 3) Participation in power and decision-making scenarios; 4) Sexual and reproductive health and rights; 5) Gender focus in education; and, finally, 6) A life free of violence. Similarly, to close the socioeconomic gaps between the sexes, the Presidential Advisory Office for Women's Equity also articulates with entities at the national and territorial levels, promoting the creation of territorial links to promote gender-focused policy in the territories. These institutional efforts have taken shape in the development of projects, the signing of pacts, the expansion of coverage, and the injection of resources in the areas of associativity, technology, access to land, technical assistance, among others.

Among the recently implemented programs, Colombia Siembra stands out, executed from 2015 to 2018, which proposed to increase the supply of agricultural products for the country and promote agricultural exports. Although this policy was aimed at all actors in the production chain, one of its objectives was to historically increase the support and participation of women in the country's agricultural sector. Thus, Colombia Siembra favored nearly 506,264 women with \$60 billion invested in productive projects of restituted families, 35% of which are the responsibility of women heads of household (*Políticas Públicas Sector Agro Benefician a Más de 506 Mil Mujeres Rurales | Finagro, n.d.*).

More recently, in October 2019, the Pact for the Equity of Rural Women was signed between the Government, trade unions, and organizations of rural women, as well as unions and companies in the agricultural production sector. This pact aims to shorten the poverty and social exclusion gaps of women in the Colombian countryside, giving priority to low-income women, and emphasizing the construction of specific measures aimed at accelerating equity between men and women in the countryside. This pact proposed five commitments to be achieved in the short and medium-term: 1. Economic empowerment for the elimination of gaps faced by women in rural areas; 2. The participation of women in scenarios of power and decision-making, 3. Sexual and reproductive rights, 4. Rights of women to a life free of violence and, finally, 5. The strengthening of gender institutions for rural women. Within the framework of this Pact, the Rural Development Agency has financed projects for 7,299 rural women in 31 departments of the country with the co-financing of Comprehensive Agricultural and Rural Development Plans, in projects in the areas of cocoa, potatoes, milk, beans, bananas, machinery banks, and agricultural inputs. At the same time, different organizations composed of rural women in marketing and farmer's market have been supported. Also, technical assistance interventions reached 6,631 users; strategies for the promotion, participation, and strengthening of associativity benefited 4,334 women in March 2020.

The generation of income to achieve economic independence has also been a relevant axis within the implementation of strategies by the national government. The MADR and its affiliated entities have offered programs that have established affirmative measures in the prioritization of groups of women and associations as beneficiaries, to increase the participation of this population group. Among the programs, it is worth mentioning "Construyendo Capacidades Empresariales Rurales (Building Rural Entrepreneurial Capacities) within the framework of El Campo Emprende, which benefited 17,642 women during its three calls for applications, representing 58.2% of the people served. Similarly, the "Generación de Ingresos y Desarrollo de Capacidades Productivas" (Income Generation and Development of Productive Capacities) project benefited 56,519 women (34.5% of the total) through strategies to ensure the commercialization of agricultural products (Ministry of Agricultural and Rural Development, 2020). Likewise, the "Oportunidades Pacíficas Mujeres Rurales" (Peaceful Opportunities for Rural Women) program was launched in 2020 to strengthen organizations of female producers in the Colombian Pacific, strengthen their capacities, and provide opportunities to generate empowerment in the context of the COVID-19 pandemic that affected the country. Aimed at organizations made up of 50% or more rural women, it focuses on the production or marketing of agricultural products for direct consumption in the departments of Cauca, Valle del Cauca, Chocó, and Nariño. This program is supported by the Korea International Cooperation Agency and the United Nations World Food Program to provide training, inputs, and technical assistance to the women involved (*Minagricultura Lanza Proyecto 'Oportunidades Pacíficas Mujeres Rurales' Que Fortalecerá Organizaciones de Mujeres Productoras de La Región Del Pacífico Colombiano*, n.d.).

Among the financial instruments offered to improve the access of women to land and productive inputs, Finagro offers, through financial intermediaries (such as Banco Agrario), agricultural credit with special conditions, guarantees to back them, and coverage of up to 100% of the direct costs of the project, to finance activities that are essential to the development of a productive

project, whether in the agricultural or fishing sector, as well as mining, rural tourism and handicraft projects. Among other things, labor expenses, infrastructure construction, purchase of machinery and equipment, inputs, and purchase of livestock may be financed. Among the institution's financial instruments there are the Credit Line for Low-Income Rural Women and the Special Credit Lines (LEC for its acronym in Spanish), which offer rate subsidies. Each year, the National Agricultural Credit Commission defines the LECs for the respective year, among which an additional interest rate subsidy of between 0.5% and 1.0% E.A. is usually granted to rural women.

Concerning efforts to increase land tenure by rural women, the National Land Agency has strategies for the adjudication of vacant land, formalization of rural land, formalization to replace illicit crops, comprehensive land subsidies, among others. In 2019, ANT benefited more than 5,600 women, 47% of the total beneficiaries of the programs. During this year, ANT awarded 25,225 hectares to women, equivalent to 39% of the land formalized. Likewise, ANT allocated 51% of the subsidies to rural women to gain access to land ownership and develop productive projects (*Agencia Nacional de Tierras Despliega Beneficios Para La Mujer Rural – Agencia Nacional de Tierras, n.d.*) .

Additionally, the Special Administrative Unit for the Management of Restitution of Land Restitution (URT for its acronym in Spanish) is responsible for facilitating the restitution of land to the owners or possessors of land or exploiters of vacant land who have been victims of dispossession or forced abandonment of their land due to the armed conflict. The URT created a program of special access to women to the restitution process, to guarantee women's right to land during the restitution process. This intervention was implemented so that women could "recognize themselves and be recognized by institutions and society as owners and workers of the land". The results obtained so far show 52% of the women belonging to the process as beneficiaries, with 35.5% of productive projects headed by women, and the training of 16,423 women victims, managing to reduce the gaps in access of women to land (*La Restitución de Tierras Empodera a Las Mujeres Víctimas - Banco de Éxitos - Función Pública, n.d.*).

### 4.3 Legal framework applicable to the CSICAP project

The following is a summary of the regulatory framework relevant to CSICAP project activities.

**Table 0.1. Summary of the legal gender framework specific to the CSICAP project**

Level	Regulation	Description
International	First World Conference on Women (Mexico, 1975). Decade Plan for the Equality of Women	Enacts the following principles of equality between men and women, in their significance and value as human beings, as well as equality in their rights, opportunities, and responsibilities. Recognizes that the obstacles that stand in the way of equality of men and women must be removed. Recognizes the need to modernize the agricultural sector in a sustainable manner that generates opportunities for rural women.
	Convention on the Elimination of All Forms of Discrimination against Women- CEDAW	"To consecrate, if they have not already done so, in their national constitutions and any other appropriate legislation the principle of the equality of men and women and to ensure by law or other appropriate means the practical realization of that principle." It also points out the importance of the role of rural women, so often undervalued, encouraging the recognition that this is vital for the development of the countryside.

	Towards the Year 2000 Strategy for the Advancement of Women – Nairobi 1985	Reiterates the need for the unity, inseparability, and interdependence of the objectives of the decade (equality and peace), about the advancement of women and their integration into economic, social, political, and cultural development. It recognizes that the deprivation of traditional forms of sustenance is one of the main consequences of environmental degradation and particularly affects women.
	1995 Beijing Platform for Action	"Combating constraints and obstacles to gender equity and advancing and empowering women worldwide". Actions under the platform include analyzing the structural linkages between gender, environment, and development in selected sectors such as agriculture, industry, fisheries, forestry, environmental health, biodiversity, climate, water resources, and sanitation;
	1980 Copenhagen Conference: "Letter of the human rights of women"	"To promote the maintenance of the three goals of equality, development, and peace, with special emphasis on the sub-theme - called employment, health, and education - as a significant component for development."
	Resolution 66/130 - Resolution 66/216	Participation of rural women in public policy and participation of women in economic, political, and social development.
	Resolution 64/140 y Resolution 62/136	United Nations agreements for the improvement of the situation of women in rural areas.
	Belem do Pará Convention	The full and free exercise of the civil, political, economic, social, and cultural rights of women and the protection of those rights consecrated in regional and international human rights instruments are recognized. The States Parties recognize that violence against women impedes and nullifies the exercise of these rights. Ratified by Colombia through Law 248 of 1995.
	The decade for women CEPAL	It is recognized that the social and economic value of unpaid domestic work of women, care as a public matter that is the responsibility of states, local governments, organizations, businesses, and families, and the need to promote the shared responsibility of women and men in the family sphere.
	Sustainable Development Goals	Roadmap for sustainable progress that leaves no one behind, particularly through SDG 5. Gender equality and empowerment of girls and women.
National	Article 43 of the Political Constitution	Whereby it is established that women and men have equal rights and opportunities.
	Law 51 of 1981	Whereby CEDAW is adopted and approved.
	Law 823 of 2003	It establishes regulations on equal opportunities for women, guarantees their rights, and incorporates gender equity actions at the national and territorial levels.
	Law 1232 of 2008 (Amends Law 82 of 1993)	Amends Law 82 of 1993, defines and dictates other provisions related to female head of household.
	Law 1257 of 2008	Adoption of regulations that guarantee a life free of violence for all women, both in the public and private spheres, and the exercise of the rights recognized in the legal system.
	Law 581 of 2000	"By which the adequate and effective participation of women in the decision-making levels of the different branches and organs of public power is regulated".
	Law 1413 of 2010 or Economy of Care Law	Includes the care economy made up of unpaid household work in the National Accounts System, to measure the contribution of women to the economic and social development of the country and as a fundamental tool for the definition and implementation of public policies.
	CONPES 161 of 2013	National Public Policy on Gender Equity, whose main objective is to contribute to guarantee the full enjoyment of the rights of Colombian women by applying the principles of equality and non-discrimination.
	Law 1955 of 2019	Whereby the National Development Plan 2018-2022 is adopted. Which includes the Pact for Women's Equity and the gender budget tracer.
	Law 731 of 2002 or Rural Women Law	Its purpose is to improve the quality of life of rural women, giving priority to low-income women, and establish specific measures aimed at accelerating equity between rural men and women.  Article 28 orders the participation of rural women in reforestation plans, programs, and projects. At least 30% of the labor force must be rural women living in the areas. They must be consulted together with the community to which they belong.

Decree 2365 of 2015	Creation of the Direction for Rural Women in the Ministry of Agriculture and Rural Development.
Law 1900 of 2018	Whereby gender equity criteria are established in the awarding of vacant lands, rural housing, productive projects, and other provisions (amending Law 160 of 1994).
Resolution 464 of 2017 – Guidelines for Family, Peasant and Community Agriculture (Ministry of Agriculture and Rural Development)	Adopting the Strategic Public Policy Guidelines for Peasant, Family and Community Agriculture. These recognize the fundamental role of rural women and the importance of the gender approach in the formulation of ACFC (for its acronym in Spanish) policy.
Resolution 311 of 2019 – (Ministry of Agriculture and Rural Development)	Whereby the paragraph of Article 5 of Law 1900 of 2018 is regulated and marginality criteria for rural women are established.
Agreement 058 of 2018 – National Land Agency	It regulates the administration and granting of rights of use to vacant land that can be awarded and grants additional points to vulnerable populations such as rural women and mothers who carry out activities aimed at food production, environmental protection, and the substitution of illicit crops.
Resolution 12096 of 2019 – National Land Agency	Modifies Article 45 of Resolution 740 of 2017 and creates a prioritization route for rural women through the recognition of the care economy as a productive activity of exploitation of the property, additional points for mothers who are heads of household and those who are organized in women's associations.
Law 1876 of 2017	"Through which the National Agricultural Innovation System (SNIA for its acronym in Spanish) is created and other provisions are issued...", through this Law the SNIA is created, where it is urged to adopt alternatives that guarantee the real participation of rural women and young people. The approaches of Agricultural Extension in the provision of the service include the promotion of the development of organizations of women. Also, a rural woman representative is assigned a seat on the Superior Council of the SNIA.
Agreement 004 of 2020 – Rural Development Agency	It establishes that rural women, ethnic groups, young people, victims, and people in the process of reincorporation are part of the five population groups subject to different attention of the Integral Rural Development Projects - PIDAR. For this purpose, 50% of the organization must be made up of women.

#### 4.4 Institutional capacities at the national and local levels

Compliance with the norms and implementation of the policies and programs indicated in the previous sections is mainly the responsibility of the entities of the Agricultural, Fishing and Rural Development Sector, which is made up of the Ministry of Agriculture and Rural Development and its many affiliated and related entities, which participate in different stages of the construction, implementation, and monitoring of public policy. The mainstreaming of the gender perspective implies the constant articulation of different agencies in each of the entities. Precisely, the responsibility for leading this articulation lies with the Ministry of Agriculture and Rural Development through the Rural Women's Directorate – DMR (for its acronym in Spanish). A technical directorate created in the Vice-Ministry of Rural Development in 2015 and its guiding axis is the implementation of Law 731 of 2002 (Law of Rural Women) in the areas of competence of the sector.

The main function of the DMR is the coordination, design, and evaluation of policy plans and projects aimed at influencing the social and economic well-being of rural women, as well as promoting coordination with national and territorial entities for the implementation of such plans and projects. At the national level, the main interlocutors of the DMR are the High Counselor's Office for Gender Equity, the agencies of the National Planning Department related to rural development and gender equity, and the entities attached to and linked to the Ministry. At the territorial level, the main interlocutors are the territorial governments (departments and municipalities) through the female secretaries of the women and rural development secretaries, or whoever acts as the liaison for gender issues in the territory.

The articulated work between national entities allows, among other things, the follow-up of the gender indicators of the sector in the National Development Plan and the Implementation Framework Plan. The monitoring and follow-up of these indicators make it possible to provide feedback within the sector on the actions taken in gender equity. Likewise, the articulation between the entities allows the formulation of joint strategies for the productive inclusion of rural women along the value chain of the agricultural and rural development sectors. This value chain ranges from access, restitution, and formalization of land to marketing strategies and the generation of added economic value.

In the area of access and formalization of land ownership, the National Land Agency (ANT for its acronym in Spanish), through the gender team in the General Directorate, has managed to incorporate affirmative measures in the access and formalization programs, in addition to formulating a priority attention route for rural women. Although the gender group of the General Directorate cannot be responsible for the implementation of the entire land policy for rural women, it has ensured the mainstreaming of the gender approach within the agency through guidelines and technical support to the different departments of the entity. For its part, the Land Restitution Unit (URT for its acronym in Spanish) has a Social Directorate, which is responsible for incorporating the gender approach into the land restitution policy. The Social Directorate has a team of experts in gender and land restitution, who are under the responsibility of formulating and designing methodologies that promote the participation of rural women in the land restitution process.

The Rural Development Agency (ADR for its acronym in Spanish), responsible for implementing agricultural policy and productive inclusion, has incorporated strategies for the participation of rural women in the different services it offers. Within the ADR, the Participation and Associativity Directorate of the Projects Vice Presidency is the unit that leads the gender issue; however, there are gender liaisons in the national directorates and territorial offices under the responsibility of the Productive Integration Vice Presidency, through which the agency implements its services. All these liaisons coordinate internally and with the Directorate of Rural Women, unions, territorial entities, and other entities to promote the participation of rural women in agricultural production.

It should be recalled that the ANT and the ADR are the main executors of the Ministry of Agriculture and agricultural policy of Rural Development, for which they have offices in the territory. However, the ANT only has eight Territorial Management Units, and the ADR has thirteen Territorial Technical Units, which reflects their weak territorial presence in the 32

departments of the country. In addition, the gender liaisons in these offices are usually in charge of multiple issues and responsibilities, which limits the capacity of the agencies to address gender issues in practice.

FINAGRO and the Agrario Bank do not have units exclusively dedicated to gender mainstreaming, but multiple units are working to create affirmative measures to promote the financial inclusion of rural women. In the case of FINAGRO, the presidential advisory team has designated a person in charge of issues of rural women, who is responsible for coordinating actions with the areas of FINAGRO and the different actors of the National Agricultural Credit Commission. Agrario Bank also has people in charge of issues of rural women in the small producer and microfinance areas. It is important to mention that Agrario Bank is the financial institution with the largest territorial presence, covering 1,036 (94%) of the country's municipalities through offices and banking correspondents.

Finally, the Rural Agricultural and Livestock Planning Unit – UPRA (for its acronym in Spanish), the entity responsible for planning the agricultural and rural sector, is building the Comprehensive Agricultural Risk Management System, an initiative to centralize information that seeks to anticipate potential risks in the sector in different areas, one of which is the well-being of producers. To this end, UPRA has a team of professionals with experience and expertise in gender issues who are identifying gender risks in several prioritized production chains.

Finally, at the national level, the role of the Rural Development Directorate and the Gender Sub directorate of the National Planning Department in providing technical support to the Ministry and its affiliated and related entities is highlighted, especially for the development of plans and policies that have an impact on the well-being of rural women and improve their productive participation in the sector.

As mentioned above, the entities responsible for implementing the national policy in the territory are the Secretariats of Women and the Secretariats of Agriculture, whose specific functions rely on the institutional arrangement of each department and municipality. In the case of the Secretariats of Women, their efforts are generally oriented towards the formulation and direction of programs that have an impact on improving the welfare of women in different fields of social, political, and economic life. In contrast, the Agricultural Secretariats are focused on territorial productive development. There are some specific cases, such as that of the Secretariat of Women of the Government of Cundinamarca, which has a unit specializing in issues of rural women. In addition to Cundinamarca, the following departments where the CSICAP project will be implemented also have Secretariats of Women: Antioquia, Arauca, Cauca, Córdoba, Huila, Meta, Nariño, Norte de Santander, Sucre, Tolima and Valle del Cauca. In other words, 12 (55%) of 22 departments could count on these secretariats as strategic allies for the implementation of the CSICAP project.

It is important to point out the role of the Secretariats of Agriculture in the implementation of income generation programs of the Ministry of Agriculture and Rural Development such as Support for Productive Alliances or El Campo Emprande, in which the Secretariats of Agriculture are responsible for promoting the call for proposals at the territorial level and disseminating affirmative measures in favor of rural women. In turn, it is the Secretariats of Agriculture that

coordinate with the regional offices of the National Land Agency and the Rural Development Agency for the development of local activities such as business fairs, markets of farmers, and business rounds.

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 <p><b>CORPORACIÓN BioParque</b> Por el desarrollo sostenible</p>	Social, Gender and Environmental study of the Project CSICAP* in Colombia	
	<b>Gender Action Plan</b> presented to: The Alliance of Bioversity International and CIAT	Date: 03/31/2021 Rev. 19/11/2021
		Deliverable No. 4

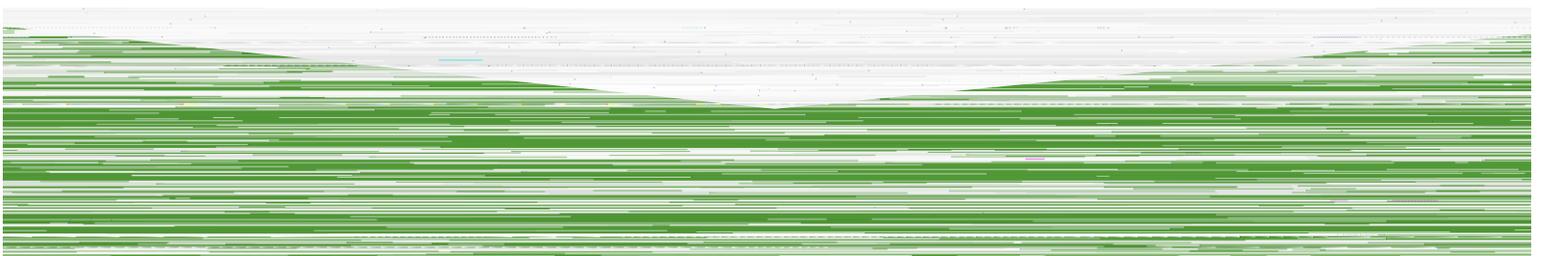
# GENDER ACTION PLAN

**CSICAP Climate-smart initiatives for climate change adaptation and sustainability in prioritized agricultural production systems in Colombia (CSICAP)\***

**Annex 8 – Part B**

Green Climate Fund Funding Proposal

**\* The initial title of the project was changed from Low-Emission and Climate Resilient Agriculture in Colombia (LECRA) to Climate-smart initiatives for climate change adaptation and sustainability in prioritized agricultural production systems in Colombia (CSICAP). All the references in this document have been changed to CSICAP. If there is any reference to LECRA should be understand as CSICAP**



Overall Objective: Help to close the gender gap in prioritized agricultural value chains and promote equitable access to the strategies, plans, programs, services, goods, and activities of the Project						
Activities	Indicators	Baseline	Target	M&E Timing	Responsible entities	Budget estimates (USD)
<b>Specific Objective related to CSICAP's first component: Reduce barriers to access to agroclimatic information faced by rural women</b>						
<b>Gender outcomes related to CSICAP's first component</b>						
<b>Men and women producers have equal access to information on seasonal climate forecasts in agriculture, as well as recommendations associated to the crops production cycle</b>	Percentage of agricultural holdings (farms) with female producers making decisions, with ICT connectivity and access	70.5%	71.1%	During and after operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture	<b>\$275,014</b>
	Percentage of agricultural holdings (farms) with female producers making decisions, that utilize ICT to access climate forecast information	24.9%	28.0%			
	Percentage of agricultural holdings (farms) with female producers making decisions, that introduced changes related to climate monitoring	1.4%	3.6%			
<b>Gender outputs related to CSICAP's first component</b>						
1.1 Comprehensive information dissemination strategy designed and implemented on agricultural practices for agroclimatic risk management, considering ethnic and gender differences, using different communication channels	Comprehensive information dissemination strategy on agricultural practices for agroclimatic risk management, considering ethnic and gender differences, using different communication channels, designed and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture	<b>\$133,778</b>
	Number of agricultural holdings (farms) with female producers making decisions, that received technical assistance on agroclimatic risks	0	13,000			
	Percentage of agricultural holdings (farms) with female producers making decisions, that received technical assistance on agroclimatic risks	30.1%	38.9%			
	Number of agricultural holdings (farms) that implemented best agricultural adaptation practices to climate change	3,171	16,171			
	Percentage of agricultural holdings (farms) with female producers making decisions, that implemented best agricultural adaptation practices to climate change	0.52%	2.7%			
1.2. Strategy designed and implemented on women producers and rural women's empowerment and their participation in decision-making positions. This strategy can be developed with the support of the Rural Women's Unit of the Ministry of Agriculture and Rural Development and	Strategy on women producers and rural women's empowerment and their participation in decision-making positions, designed and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team, Ministry of	<b>\$141,236</b>

the Presidential Council for Women's Equity, which already have training programs.	Number of women trained in women producers and rural women empowerment and their participation in decision-making positions	0	12,750		Agriculture (Rural Women Directorate)	
	Percentage of agricultural holdings (farms) with female producers making decisions	33.3%	36.2%			
<b>Gender activities related to CSICAP's first component</b>						
1.1.1 Design and implement plan for disseminating information on agroclimatic risk management that includes a language analysis differentiated by region, considering ethnic elements -if necessary-, transmission schedules (taking into account variables of the care economy and sexual division of labor). The analysis shall present the scope of the plan in terms of number of people disaggregated by gender, age, ethnicity. These plans will be supported by consultations with women and women's organizations contacted with the support of the Ministry of Agriculture and Rural Development.	Plan for disseminating information on agroclimatic risk management that includes a language analysis differentiated by region, considering ethnic elements -if necessary-, transmission schedules (taking into account variables of the care economy and sexual division of labor, since the call), designed and implemented	0	1	Pre and during operation	Producer Associations CIAT, Gender Team, Ministry of Agriculture (Rural Women Directorate, Agricultural Innovation Directorate)	\$0
1.1.2 Within the plan for disseminating information on agroclimatic risk management, define and implement actions through different communication channels, with the support of the local platforms of Vive Digital (National Plan to develop a digital ecosystem in the country) and other platforms of information dissemination (community radio stations, booklets with audio instructions).	Dissemination actions on agroclimatic risk management defined and implemented	0	1	Pre and during operation	CIAT, Gender Team, Producer Associations	\$0
1.1.3. Elaborate in a participatory way a document that articulates into project activities the local knowledge and practices of men and women related to the management of agroclimatic risk, both in the crop and in other aspects, such as the home, the agroecological calendar, irrigation strategies and practices and tools to manage drought. This information will also be disseminated within action 1.1.1 of component 1.	Document that articulates into project activities the local knowledge and practices of men and women related to the management of agroclimatic risk elaborated	0	9	During operation	Producer Associations CIAT, Gender Team, Ministry of Agriculture	\$36,000
1.1.4. Design and implement actions to train men and women producers in Information Literacy with an ethnic, age and gender focus	Actions to train men and women producers in Information Literacy with an ethnic, age and gender focus designed and implemented	0	1	Pre and during operation	Producer Associations CIAT, Gender Team	\$35,903
1.1.5 Design and implement a plan to cofinance electronic communication devices (smartphones) for (direct and indirect) women beneficiaries of the program. Women have lower levels of access to ICT, not only due to knowledge gaps, but also to access to resources. The co-financing plan includes an electronic device financing strategy for women to ensure access to program information.	Plan to cofinance electronic communication devices (smartphones) for (direct and indirect) women beneficiaries of the program, designed and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team	\$61,875

<p>1.2.1 Design and implement a training and socialization plan on women's empowerment issues. The plan addresses at least the following topics:</p> <ul style="list-style-type: none"> <li>- Leadership, gender, and inequality</li> <li>- Gender-based violence</li> <li>- Local, regional, and national decision-making bodies and positions</li> <li>- Assertive communication</li> <li>- Associativity</li> <li>- Process of formalizing organizations, associations, or businesses</li> </ul> <p>Special emphasis will be placed on the participation of women in instances such as the Agroclimatic Technical Tables (Women-only activities)</p>	Training and socialization plan on women's empowerment issues designed and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team	\$133,681
<p>1.2.2. In addition, design and implement a plan to promote the participation of women in local and regional decision-making bodies of the agricultural sector, that liaise with local and regional authorities (mayor's offices, governorates). The plan includes activities to disseminate information on calls for applications to decision-making positions, work sessions with local authorities.</p> <p>Special emphasis will be placed on the participation of women in instances such as the Agroclimatic Technical Tables. (Women-only activities)</p> <p>It will be linked to the Rural Women Directorate of the Ministry of Agriculture and Rural Development so that through its Rural Women Information System (FOMUR) the registration of participating women is promoted and in this way, there is better communication about the plans, programs, and projects at the national level.</p>	Plan to promote the participation of women in local and regional decision-making bodies of the agricultural sector, designed and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture (Rural Women Directorate)	\$3,333
<p>1.2.3 Include and implement a module within the training plan and participation plan for young rural women that includes the following elements:</p> <ul style="list-style-type: none"> <li>- Dissemination of information on decision-making bodies or positions exclusive for the rural youth (including, among others, the Municipal Youth Councils)</li> <li>- Training on the Statute of Youth Participation</li> <li>- Dissemination and training on institutional programs for young people.</li> </ul> <p>This, with the support of the Ministry of Agriculture and Rural Development and its consolidated offer for young people.</p>	Training and participation module for young rural women, included and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture (Rural Women Directorate)	\$4,222
<b>Specific Objective related to CSICAP's second component: Strengthen the capacities of rural women for sustainable, climate-resilient agriculture that guarantees food security for them and their households</b>						
<b>Gender outcomes related to CSICAP's second component</b>						
Men and women producers have equitable access to information to take advantage of and implement technologies and practices for the adoption of sustainable production systems that promote resilience to climate variability, efficient use of water and low-carbon agriculture	Percentage of agricultural holdings (farms) with female producers making decisions, that adopted good agricultural practices due to the extension service	1.0%	1.4%	During and after operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture	\$460,333
	Percentage of agricultural holdings (farms) with female producers making decisions, that improved the management of ecosystem services and biodiversity conservation due to the extension service	0.2%	0.3%			

	Percentage of agricultural holdings (farms) with female producers making decisions, that introduced changes or improvement in the selection of seeds or genetic material	0.5%	0.6%			
	Percentage of agricultural holdings (farms), with female producers making decisions, that implemented soil management practices	59.4%	60.6%			
	Percentage of agricultural holdings (farms) with female producers making decisions, that implemented pest control practices	62.6%	62.7%			
<b>Gender outputs related to CSICAP's second component</b>						
2.1. Strategy designed and implemented for the productive inclusion of (direct and indirect) women beneficiaries based on new opportunities of sustainable production practices throughout the value chain links.	Strategy for the productive inclusion of (direct and indirect) women beneficiaries designed and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture	<b>\$460,333</b>
	Number of women receiving agricultural extension service	0	2,310			
	Percentage of female-headed rural households that are not monetary poor	66.2%	67.7%			
<b>Gender activities related to CSICAP's second component</b>						
2.1.1 Engage women beneficiaries as leaders in the process of implementing CSICAP's plans and activities for the conservation, preservation and restoration of strategic areas and ecosystems. The banana sector has expressed interest in signing agreements on the conservation of natural resources. Similarly, the sugar cane sector will support the conservation of hydrographic basins.	Women-led plans for the conservation, preservation and restoration of strategic areas and ecosystems, designed and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team	\$0
2.1.2 Design and implement a plan for the recovery and/or promotion of quality native seeds and species with commercial gains, managed by rural women (direct and indirect beneficiaries). This plan will be linked to the project's activities developing climate-resilient varieties, especially for the potato, corn, rice and sugar cane crops, as well as the National Seed Plan led by Agrosavia.	Women-led plan for the recovery and/or promotion of quality native seeds and species with commercial gains, designed and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture	\$90,611

<p>2.1.3. Design and implement a training and support plan for the production and commercialization of organic fertilizers and bioproducts for the management of pests and diseases, led by women farmers' groups and/or organizations (direct and indirect beneficiaries of the project). The training module, to be carried out with all the crops/chains involved in the project, includes at least the following topics:</p> <ul style="list-style-type: none"> <li>- Agricultural production, marketing and distribution</li> <li>- Associativity (It is articulated with action 1.2.1 of component 1 and with Action 3.2.2 of component 3 of this action plan).</li> <li>- Phytosanitary risks</li> <li>- Consequences of the use of agrochemicals.</li> <li>- Design of business plans</li> <li>- Financial literacy</li> </ul> <p>Additionally, co-financing of the projects will be sought.</p>	<p>Training and support plan for the production and commercialization of organic fertilizers and bioproducts for the management of pests and diseases, led by women farmers' groups and/or organizations, designed and implemented</p>	<p>0</p>	<p>1</p>	<p>Pre and during operation</p>	<p>Producer Associations, CIAT, Gender Team, Ministry of Agriculture</p>	<p>\$225,000</p>
<p>2.1.4. Design and implement a training and dissemination module for young rural women on primary processing, management, marketing, among other topics.</p>	<p>Training and dissemination module for young rural women on primary processing, management, marketing, designed and implemented</p>	<p>0</p>	<p>1</p>	<p>Pre and during operation</p>	<p>Producer Associations, CIAT, Gender Team, Ministry of Agriculture</p>	<p>\$47,500</p>
<p>2.1.5. Design and implement a training plan exclusively for women on issues of climate resilient agriculture that focuses on the tasks performed by women within each crop/chain, such as: seed selection, diversification of crops, subsistence farming, pre and post-harvest. Given that women in the banana, potato and panela cane sectors are especially excluded from productive activities, this plan will be specially formulated for them (direct and indirect women beneficiaries). (Women-only training plan).</p>	<p>Training plan exclusively for women on issues of climate resilient agriculture that focuses on the tasks performed by women within each crop/chain, designed and implemented</p>	<p>0</p>	<p>1</p>	<p>Pre and during operation</p>	<p>CIAT, Gender Team, Producer Associations</p>	<p>\$97,222</p>
<p><b>Specific Objective related to CSICAP's third component: Reduce structural barriers that hinder the entry and full participation of rural women in agricultural value chains</b></p>						
<p><b>Gender outcomes related to CSICAP's third component</b></p>						
<p>The agricultural innovation processes respond to the ethnic, regional, age and gender characteristics of the producers engaged in the project, in order to guarantee an equal participation.</p>	<p>Percentage of agricultural holdings (farms) with female producers making decisions</p>	<p>33.30%</p>	<p>36.9%</p>	<p>During and after operation</p>	<p>Producer Associations, CIAT (Gender Team), Ministry of Agriculture</p>	<p><b>\$845,967</b></p>
	<p>Percentage of female-headed rural households</p>	<p>29.5%</p>	<p>34.8%</p>			
	<p>Average time spent by rural women in unpaid care work</p>	<p>7:52</p>	<p>7:20</p>			
	<p>Rural female employment rate</p>	<p>37.5%</p>	<p>38.4%</p>			
	<p>Percentage of agricultural holdings (farms) with female producers making decisions, with access to credit or funding</p>	<p>17.9%</p>	<p>18.0%</p>			
	<p>Percentage of agricultural holdings (farms) with female producers making decisions, participating in farmers' groups or organizations</p>	<p>20.7%</p>	<p>22.5%</p>			

	Percentage of agricultural holdings (farms) with female producers making decisions, with access to agricultural extension service	30.10%	50.4%			
	Percentage of women on the Board of Directors of the Producer Associations	FNC: 0%; Fedepanela: 7%; Fedearroz: 5%; Fedepapa: 5%; Fenalce: 6%; Fedegan: 9%; Asbama:11%; Asocaña: 0%	30%			
<b>Gender outputs related to CSICAP's third component</b>						
3.1. Strategy designed and implemented for training in gender equality and gender mainstreaming within the technical assistance process developed by the project. This strategy can be developed with the support of the Directorate for Rural Women of the Ministry of Agriculture and Rural Development and the Presidential Council for Equity for Women.	Strategy for training in gender equality and gender mainstreaming within the technical assistance process developed by the project, designed and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture	<b>\$281,133</b>
	Number of men and women producers trained in gender equality and gender mainstreaming	0	16,000			
	Number of extension workers trained in gender equality, gender mainstreaming and gender-based violence.	0	200			
	Number of women trained and certified as agricultural extension workers	0	100			
3.2. Strategy designed and implemented for the creation of community networks for knowledge management and sharing, by engaging women's groups and associations as agents of knowledge transmission, construction, and adoption.	Strategy for the creation of community networks for knowledge management and sharing, by engaging women's groups and associations as agents of knowledge transmission, construction and adoption, designed and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture	<b>\$107,333</b>
	Number of agricultural holdings (farms) with female producers making decisions, participating in farmers' groups or organizations	0	540			
	Percentage of agricultural holdings (farms) with female producers making decisions, participating in farmers' groups or organizations	20.7%	22.5%			
3.3 Strategy designed and implemented to liaise with government officials and engage women beneficiaries into public programs aimed to improve women's access to factors of production. This strategy can be developed with the support of the Directorate for Rural Women of the Ministry of Agriculture and Rural Development.	Strategy to liaise with government officials and engage women beneficiaries into public programs aimed to improve women's access to factors of production, designed and implemented	0	1	Pre and during operation	Gender Team, Ministry of Agriculture	<b>\$10,000</b>

	Number of women beneficiaries engaged into public programs aimed to improve women's access to factors of production	0	1,500			
3.4 Pilot projects systematized and implemented to approach the care economy at the local level for (direct and indirect) women beneficiaries.	Number of pilot projects providing local care services designed and implemented	0	9	Pre operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture	\$297,500
	Number of women beneficiaries with care services	0	450			
	Number of male and female children, seniors, and people with disabilities receiving care services	0	180			
3.5 Plans designed and implemented for mainstreaming gender in Producers Associations' policies and practices	Number of plans for mainstreaming gender in Producers Associations' policies and practices designed and implemented	0	9	Pre and during operation	Gender Team, Producer Associations	\$150,000
	Number of Producer Associations that mainstreamed gender into their policies and practices	0	9			
<b>Gender activities related to CSICAP's third component</b>						
3.1.1 Develop and deliver training modules with men and women producers participating in the project on gender equality and gender mainstreaming that include, at least, the following topics: - The care economy - Sexual division of labor - Gender violence (Hotlines, public services, among others) - Women rights - Masculinities - Economic and financial literacy (household and farm financial management. It should include awareness about the recognition and payment of activities carried out by women: preparing food for day laborers, among others). -A specific module for young rural women about sexual and reproductive rights. This strategy will be supported by the workshops already being developed by the Ministry of Agriculture and Rural Development on rights, gender, and the care economy for rural producers, and the economic and financial education workshops "My finances count" for rural women and youth.	Training modules with men and women producers participating in the project on gender equality and gender mainstreaming, developed and delivered	0	1	Pre and during operation	Producer Associations CIAT, Gender Team, Ministry of Agriculture (Rural Women Directorate)	\$133,333
3.1.2. Develop and deliver a training module for women producers (women-only activities), using various methodologies (e.g. female farmer-to-female farmer extension), for the implementation of new technologies provided by the Project	Training module for women producers (women-only activities) for the implementation of new technologies provided by the Project, developed and delivered	0	1	Pre and during operation	Gender Team, Producer Associations	\$20,833

<p>3.1.3. Design and implement a gender-sensitive plan specifying the strategy for the inclusion of women in training activities and women's access to technology -which will be part of the project's agricultural extension strategy-. The plan includes:</p> <ul style="list-style-type: none"> <li>- Consensus regarding the schedule of activities (considering care work).</li> <li>- Adequate and pertinent communication methods for the elderly population.</li> <li>- Follow-up actions on women's assistance to project activities to ensure that their training process is completed</li> <li>- Provision of care services for children (those who take care of them during project activities must receive payment for this work)</li> </ul>	Gender-sensitive plan specifying the strategy for the inclusion of women in training activities and women's access to technology, designed and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture (Rural Women Directorate)	\$36,133
<p>3.1.4. Design and implement a gender awareness training plan with agricultural extension workers for the subsequent implementation of the gender equality training module with producers (Action 3.1.1 Component 3). This plan will include awareness-raising on Gender-Based Violence and will be supported by the workshops that the Ministry of Agriculture and Rural Development is already developing on rights, gender and the economy of care for rural producers.</p>	Gender awareness training plan with agricultural extension workers designed and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture	\$78,333
<p>3.1.5 Design and implement a training and certification plan for women extension workers, with the support of SENA and in response to the demand for agricultural extension workers from the Producer Associations, in order to facilitate their subsequent engagement. The plan will emphasize support strategies for the promotion of young rural women as extension workers.</p>	Training and certification plan for women extension workers designed and implemented	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture	\$12,500
<p>3.2.1. Develop participatory work sessions with women to discuss the barriers in accessing agricultural and productive services: time constraints, difficulties in accessing technical assistance and recommendations to provide a extension service tailored to their needs (availability of time and resources), which serves as input for action 3.1.3 component 3. The work sessions must guarantee the participation of different groups of women based on their ethnicity and age.</p>	Participatory work sessions with women to discuss the barriers in accessing agricultural and productive services, developed	0	18	During operation	Producer Associations, CIAT, Gender Team	\$7,333
<p>3.2.2. Design and implement local work plans to promote the participation of women in (women) farmers' groups or organizations that promote mutual trust, collaboration and training in agricultural and productive issues among them, as a tool to share knowledge and information regarding climate-resilient agriculture and build economic and social processes that allow the sustainability of the implemented strategies. This strategy can be developed with the support of the Rural Development Agency.</p>	Local work plans to promote the participation of women in (women) farmers' groups or organizations designed and implemented	0	9	Pre and during operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture (Rural Women Directorate)	\$100,000
<p>3.3.1 Implement sessions to share information regarding and engage women beneficiaries into public programs (led by the Ministry of Agriculture and Finagro such as the Special Credit Line (LEC) for rural women and youth and other LEC) aimed at improving women's access to credit, financial inclusion and literacy. The activities shall include specific sessions for young rural women sharing programs that target their population group as well as the courses in Economic and Financial Education available to the Ministry of Agriculture</p>	Sessions to share information regarding and engage women beneficiaries into public programs aimed at improving women's access to credit, financial inclusion and literacy, implemented	0	15	During operation	Gender Team, Ministry of Agriculture	\$5,000

and Rural Development and the Special Lines of Credit (LEC) that benefit women.						
3.3.2 Implement sessions to share information regarding and engage women beneficiaries into public programs (led by the Ministry of Agriculture and the National Land Agency) aimed at improving women's access to land. The National Land Agency has awareness plans about the different processes of access and formalization of rural property for natural persons or persons belonging to ethnic groups. (Women-only activities).	Sessions to share information regarding and engage women beneficiaries into public programs aimed at improving women's access to land, implemented	0	15	During operation	Gender Team, Ministry of Agriculture	\$5,000
3.4.1 Create a document prioritizing the areas (municipalities, townships, rural counties) where to install the care services/facilities of the local pilot projects. The document must include at least: - Selection criteria - Budget. The convergence of different sources of public, private and international cooperation funding will be sought	Document prioritizing the areas (municipalities, townships, rural counties) where to install the care services/facilities of the local pilot projects, created	0	9	Pre and during operation	Producer Associations, CIAT, Gender Team, Ministry of Agriculture	\$0
3.4.2 Implement a care needs assessment and design an action plan with (direct and indirect) women beneficiaries in the prioritized areas (it must be ensured that not only women belonging to organizations or formal groups participate) in order to design and implement a pilot project that offers several care services/facilities aimed to reduce the time allocated to unpaid care work. It is expected to have the participation not only of the actors of the CSICAP project but also of public agencies of the social inclusion sector of the national government (Prosperidad Social, ICBF, Ministry of Health) and the Ministry of the Environment, as well as local governments, among others. The strategy includes, at a minimum: - Inclusive call for participants - care needs assessment document - Pilots' action plan based on the needs and characteristics of the territory - Liaison strategy with local and national actors	Care needs assessment and action plan of a local care services pilot project designed and implemented with (direct and indirect) women beneficiaries	0	1	Pre operation	Producer Associations, CIAT, Gender Team Ministry of Agriculture	\$14,444
3.4.3 Design, validate, and implement with a participatory methodology, a pool of care services bases on what was identified in the previous activity. Among the possible services, the pilot will provide one service per Producer Association from among those that follow, and three nurseries will also be implemented (or care centers that operate year-round or during harvest seasons): - Transportation service for children to public care facilities (Madres Comunitarias and other ICBF services) and those provided by the Producer Association - Community laundry facilities (It must be guaranteed that the spaces where this service is provided have the conditions to guarantee that the service is effectively provided). - Community dining rooms for children, people with disabilities and the elderly.	Local care services pilot project implemented	0	9	Pre and during operation	Producer Associations, CIAT, Gender Team Ministry of Agriculture	\$90,556

- Efficient cookstoves for cooking with firewood, with support from the Ministry of the Environment Other specific interventions such as lactation rooms and brochures with a summary of the municipality's care offer will also be considered.						
3.4.4 Create a network of daycare and childcare facilities for (direct and indirect) women beneficiaries of the project. The facilities will be located at the Producer Associations' offices to promote the reduction of time allocated by women to unpaid care work. The service provided will be totally free.	Network of daycare and childcare facilities at the Producer Associations' offices for (direct and indirect) women beneficiaries of the project created	0	9	During operation	Producer Associations, CIAT, Gender Team	\$192,500
3.5.1. Develop a training module on gender equality with all the employees of each of the Producer Associations, which includes specific sessions according to the roles and positions of the employees (customer service, managerial roles, etc.).	Training module on gender equality with all the employees of each of the Producer Associations developed	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team	\$0
<b>Gender activities specific to each Producer Association</b>						
<b>3.5.2 Asbama, Fedepanela: Strengthen the (existing) Gender Action Plan that includes:</b> - Regulations on quotas for the participation of women in boards of directors - Strategy to promote the inclusion of women extension workers within the Producer Association - Gender-sensitive Budgeting to identify funded activities and/or projects aimed at improving the conditions of women producers	Producer Association's Gender Action Plan strengthened	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team	\$33,333

<p><b>3.5.3 Fedegan, Fenalce: Design the Gender Action Plan that mainstreams gender within the Association's policies and practices. The Plan must include:</b></p> <ul style="list-style-type: none"> <li>- Gender monitoring strategy</li> <li>- Affirmative actions to improve the access of women producers to agricultural extension services</li> <li>- Guidelines for the dissemination of information to women producers (Mainstreaming gender on dissemination activities)</li> <li>- Regulations on quotas for the participation of women in boards of directors</li> <li>- Strategy to promote the inclusion of women extension workers within the Producer Association</li> <li>- Gender-sensitive Budgeting to identify funded activities and/or projects aimed at improving the conditions of women producers</li> <li>- Protocol for the prevention and eradication of workplace and sexual harassment and any form of discrimination</li> <li>- Engagement strategy with public and non-governmental institutions to develop initiatives that benefit women producers</li> </ul>	Producer Association's Gender Action Plan designed	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team	\$33,333
<p><b>3.5.4 Fedepapa, Fedearroz, Augura, Asocaña Design the Gender Action Plan that mainstreams gender within the Association's policies and practices. The Plan must include:</b></p> <ul style="list-style-type: none"> <li>- Gender monitoring strategy</li> <li>- Affirmative actions to improve the access of women producers to agricultural extension services</li> <li>- Guidelines for the dissemination of information to women producers (Mainstreaming gender on dissemination activities)</li> <li>- Regulations on quotas for the participation of women in boards of directors</li> <li>- Strategy to promote the inclusion of women extension workers within the Producer Association</li> <li>- Gender-sensitive Budgeting to identify funded activities and/or projects aimed at improving the conditions of women producers</li> <li>- Protocol for the prevention and eradication of workplace and sexual harassment and any form of discrimination</li> </ul>	Producer Association's Gender Action Plan designed	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team	\$66,666
<p><b>3.5.5 FNC: Strengthen the (existing) Gender Action Plan that includes:</b></p> <ul style="list-style-type: none"> <li>- Protocol for the prevention and eradication of workplace and sexual harassment and any form of discrimination</li> </ul>	Producer Association's Gender Action Plan strengthened	0	1	Pre and during operation	Producer Associations, CIAT, Gender Team	\$16,666
<b>TOTAL GAP BUDGET</b>						<b>\$1,581,314</b>
<b>GCF Funding</b>						<b>\$1,215,314</b>
<b>Other sources of funding (Production Associations, CIAT, Agrosavia, Ministry of Agriculture)</b>						<b>\$366,000</b>

Source: Prepared by the authors.